

PACIFIC SEABIRDS



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PACIFIC SEABIRD GROUP

Dedicated to the Study and Conservation of Pacific Seabirds and Their Environment

The Pacific Seabird Group (PSG) was formed in 1972 due to the need for better communication among Pacific seabird researchers. PSG provides a forum for the research activities of its members, promotes the conservation of seabirds, and informs members and the public of issues relating to Pacific Ocean seabirds and their environment. PSG holds annual meetings at which scientific papers and symposia are presented. The group's journals are *Pacific Seabirds* (formerly the *PSG Bulletin*), and *Marine Ornithology* (published jointly with the African Seabird Group, Australasian Seabird Group, Dutch Seabird Group, and The Seabird Group [United Kingdom]; www.marineornithology.org). Other publications include symposium volumes and technical reports. Conservation concerns include seabird/fisheries interactions, monitoring of seabird populations, seabird restoration following oil spills, establishment of seabird sanctuaries, and endangered species. Policy statements are issued on conservation issues of critical importance. PSG members include scientists, conservation professionals, and members of the public from both sides of the Pacific Ocean. It is hoped that seabird enthusiasts in other parts of the world also will join and participate in PSG. PSG is a member of the International Union for Conservation of Nature (IUCN), the Ornithological Council, and the American Bird Conservancy. Annual dues for membership are \$30 (individual and family); \$24 (student, undergraduate and graduate); and \$900 (Life Membership, payable in five \$150 installments). Dues are payable to the Treasurer; see Membership/Order Form next to inside back cover for details and application.

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Pacific Seabirds

Pacific Seabirds (ISSN 1089-6317) is published twice a year in the spring and fall. It informs PSG members about regional seabird research and conservation news. *Pacific Seabirds* seeks submissions of short peer-reviewed articles, reports, and other items that relate to the conservation of seabirds in the Pacific Ocean. Abstracts of papers presented at the annual meeting are included in the Spring issue; the Fall issue contains a summary of ongoing research. All materials should be submitted to the Editor, except that conservation-related material should be submitted to the Associate Editor for Conservation. Information for contributors to *Pacific Seabirds* is published in each Fall issue. Deadlines are March 15 for the Spring issue and September 15 for the Fall issue. Back issues of the *Bulletin* or *Pacific Seabirds* may be ordered from the treasurer; please remit \$2.50 each for volumes 1-8 (1974-1981) and \$5.00 each for volume 9 and later (see Membership/Order Form next to inside back cover for details).

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REPORTS

Reports provide up-to-date information on current research and issues. They are not peer-reviewed and should not be cited without the author's permission.

ESTIMATION OF THE ECOLOGICAL CONDITION OF THE GULF OF TAUISKAYA (NORTHERN OKHOTSK SEA, RUSSIA), BASED ON THE POPULATION DYNAMICS OF SEABIRD COLONIES

L. Zelenskaya

Observations on seabird colonies in the Gulf of Tauiskaya, Far Eastern Russia, have been carried out for two decades. Monitoring sites include Talan Island, Shelikan Island, Umara Island, and the coast of the Kony Peninsula (Figure 1). The purpose of this paper is to use data on the dynamics of seabird populations as an indicator of the ecological condition of this water body.

The Gulf of Tauiskaya is one of most highly productive areas of the Okhotsk Sea. Rivers with large salmon runs, the Taiu, Yana, Arman', and Ola, run into it. The tidal range is 5m. A branch of the Yamskoe current coming through the Olskii Strait determines the intensity of circulation in the gulf and forms permanent counterclockwise gyres. Vortical flows in east and central parts of gulf carry low-salinity water to the sea through the Likhacheva Strait (Chernyavskii and Radchenko 1994). All these processes contribute high biological productivity of plankton and benthic communities. The eastern (Odyan Gulf) and western (Amakhtonskii Gulf) parts of the Gulf of Tauiskaya are isolated hydrologically from each other, to the extent that their plankton development can be considered totally independent (Aphanasieff et al. 1994). The abundance of plankton provides forage for young fishes, except in warm and low-salinity coastal waters. Large spawning schools of capelin (*Mallotus villosus*) approach the coast annually (Shilin, 1970). Spawning areas of Pacific herring (*Clupea pallasii*) also are located in the Gulf of Tauiskaya.

The distribution of seabird colonies is correlated with zones of high biological productivity of marine waters (Golubova and Pleschenko 1997).

At the same time, one of largest potential pollution sources in the region, the city of Magadan, is located almost at the center of Gulf of Tauiskaya. Magadan is the largest town on the continental coast of the Okhotsk Sea; it is an industrial center and seaport that provides materials and oil products for the whole Magadan Region.

The ecological condition of the western Gulf of Tauiskaya—the Amakhtonskii Gulf and the adjoining shallow Motikleiskii Bay—can be estimated from the condition of seabird colonies on Talan Island and the Shelikan Islands. Study of these seabird colonies started in the mid-1980s. Talan Island has been monitored annually since then throughout the breeding season. On Shelikan Island similar observations were conducted in 1986-1987, but after that only periodic short-term visits took place. Consistent monitoring of Black-legged Kittiwakes (*Rissa tridactyla*) on Talan Island (more than 40,000 individuals; Kondratyev et al. 1992) showed rather stable breeding parameters until the early 1990s, including breeding success (number fledging per pair), proportion of nonbreeding pairs, and average size of clutch. Then the parameters decreased sharply, and after the extremely unsuccessful season of 1993, nest initiation by kittiwakes shifted from the first 10 days of June to the beginning of the 4th week of June. During

the following two years kittiwakes were still affected by the crisis—the average size of clutch was small, the proportion of nonbreeding pairs was high, and breeding success was very low. Then the situation stabilized at this colony and egg-laying became the norm. The second extremely unsuccessful season for Talan Island kittiwakes in almost 10 years was recorded in 2002 (Zelenskaya 2003). However, the death of nestlings from starvation was connected with the absence of capelin in their diet in that year only, because the approach of spawning schools was delayed in that season. All other parameters, such as the stable condition of other species of seabirds and the rather high breeding success of kittiwakes in the subsequent season (2003), show that no sharp changes or crisis had occurred in the ecosystem.

The stable and healthy condition of coastal waters in Amakhtonskii Gulf is verified by observations on seabirds of the Shelikan Islands. At this colony the number of kittiwakes increased from 1100 pairs in the mid-1980s to 3520 pairs in 2003. During the same period the number of the Slaty-backed Gulls (*Larus schistisagus*) increased even more, from 2000 to 6000 pairs (Zelenskaya and Khoreva 2003). This occurred even though Slaty-backed Gulls lost anthropogenic foods at the beginning of the 1990s, because of economic reforms (the closing of animal farms), and switched completely to natural forage. Anthropogenic pressure is not high in the western Tauiskaya Gulf. This is reflected

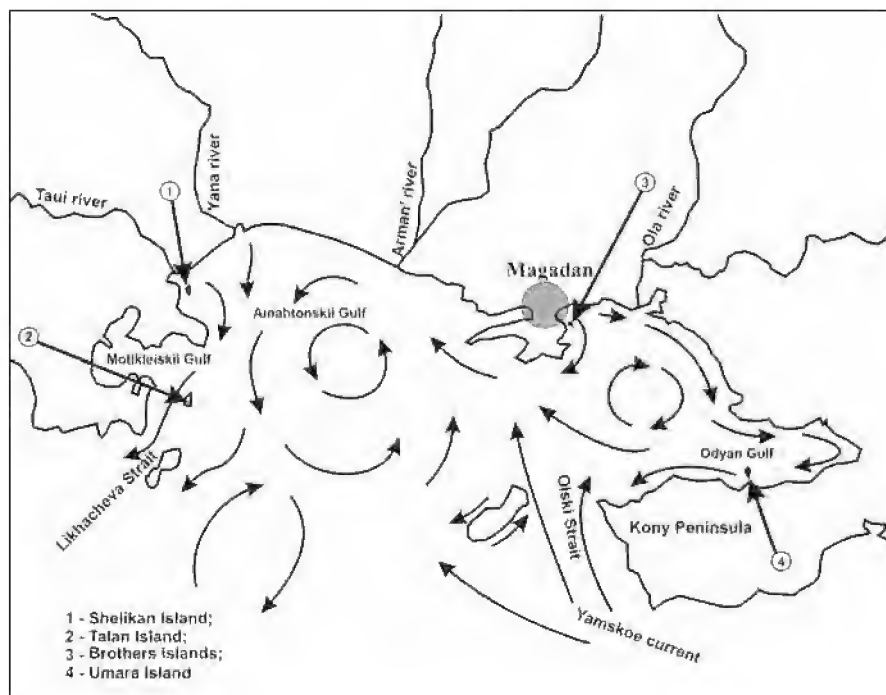


FIGURE 1. The Gulf of Tauiskaya.

in the high nesting density of Steller's Sea Eagles (*Haliaeetus pelagicus*) which are very sensitive to disturbance, on the coast of the Amakhtonskii Gulf and especially in the "Gniloi Ugol" section of Motikleiskii Bay (one pair per 2 km of coast). Shelikan Island is the only exception; it has an intensive human harvest of Slaty-backed Gull eggs, which results in annual interruption of Steller's Sea Eagle nesting attempts. The disturbance also causes egg-laying by Slaty-backed Gulls to be shifted by two weeks because of mass replacement laying.

The ecological condition of eastern Gulf of Tauiskaya—the Odyan Gulf—can be estimated from data on seabird colonies on Umara Island and the Kony Peninsula coast. Observation of seabird colonies on Umara Island began in the 1990s. Data were initially collected every breeding season, but after 1996 the colony was inspected again only in 2005. The territory of the Kony Peninsula is under jurisdiction of Magadan State Nature Reserve; visits by ornithologists to colonies there took place in 1987, 1996, and 2005. Stable ecological conditions in the Odyan Gulf and good feeding conditions for seabirds have resulted in an increase

of the Umara Island colony from 12,400 to 28,500 individuals for the period 1995–2005. Especially significant increases were recorded for Common Murres (*Uria aalge*) (from 900 to 3900 individuals), Black-legged Kittiwakes (from 1600 to 7000 pairs), and Slaty-backed Gulls (from 1000 to 2900 pairs).

Investigations in the 1990s showed that all breeding parameters of Slaty-backed Gulls on Umara Island were similar to those on Shelikan Island, and breeding success of Kittiwakes on Umara Island was higher than on Talan Island as a rule. The productivity of both Slaty-backed Gulls and Black-legged Kittiwakes on Umara Island was higher in 2005 than in 1995. Anthropogenic pressure is low here. The Steller's Sea Eagle nests annually on Umara Island. People collect gull eggs there only in some years and in very small quantities.

At the same time, in the Magadan State Nature Reserve on the Kony Peninsula, the number of seabird colonies has declined. The beginning of this process was recorded in 1996. At that time the numbers of Horned Puffins (*Fratercula corniculata*), Tufted Puffins (*F. cirrhata*), and Spectacled Guillemots (*Cephus*

carbo) were considerably reduced in comparison with those counted in 1987 (Golubova and Pleschenko 1997). These authors also noted unoccupied former sites with traces of excrement. Our observations in 2005 showed a reduction by almost two thirds in the number of Slaty-backed Gulls for the period 1996–2005. In the same period a unique large colony of Black-legged Kittiwakes on the Kony Peninsula (Cape Skalistiy, near Umara Island) was reduced from 5500 to 3200 pairs. There were no infringements on the management of the reserve, nor has there been any known human intervention in the ecology of the gulf. Probably the reduction in numbers of ledge-nesting birds has been caused by natural collapse of the cliffs. In 1996, we also observed numerous traces of excrement on coastal rocks in areas where colonies had formerly existed. At present there are no longer any ledges to be seen on these sites—only smooth vertical walls.

The ecological condition of marine waters in the Gertnera Inlet, near the city of Magadan, can be estimated from the condition of seabird colonies on the Brothers Islands, which are located practically within the city boundaries. Ornithological inspection and counts of birds were carried out on these islands in 1991 (Golubova and Pleschenko 1997) and were repeated in 2005. During this period, economic reforms resulted in the closing of many industries in the city, including a tannery and other enterprises that had discharged untreated waste waters into the Magadanka River, which runs into the Gertnera Inlet. At the same time, financial instability and the impoverishment of the human population have resulted in a large growth of small-boat fishing in coastal waters. As a side effect, there also has been mass harvesting of Slaty-backed Gull eggs on islands 1.5 km from the coast. At the bottom of the rocks on almost inaccessible islands, only Slaty-backed Gulls and a few Horned Puffins were nesting (the latter are now absent); Black-legged Kittiwakes and Common Murres were nesting on almost vertical cliffs. On our most recent visit we recorded sharp changes in the number

of seabirds: Black-legged Kittiwakes had increased from 1000 pairs in 1991 to 5400 in 2005, and Common Murres from 1000 individuals up to 5300, whereas Slaty-backed Gulls had decreased from 1000 pairs to 300.

Thus, as a whole it is possible to estimate the condition of Gulf of Tauiskaya as stable and favorable, which was reflected in steady growth and high productivity in seabirds (despite occasional failures in some areas because of unstable climatic conditions), and increasing populations of piscivorous seabirds in colonies at various locations in Tauiskaya Gulf. The unfavorable influence of an industrial center in the Gertnera Inlet has decreased during last decade, which also was reflected in a steady increase of a seabird population nesting within the city boundaries. However, strong adverse pressure from humans still exists at seabird colonies which are accessible to people.

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COLONY SIZE, NESTING SUCCESS, AND PREDATION ON SALMON SMOLTS BY CASPIAN TERNS AND DOUBLE-CRESTED CORMORANTS IN THE LOWER COLUMBIA RIVER

Dan Roby, Ken Collis, Jessica Adkins, Yasuko Suzuki, Don Lyons, and Anne Mary Myers

Investigation of seabird predation on salmon smolts in the Columbia River was continued for another year by Oregon State University, the U.S. Geological Survey-Oregon Cooperative Fish and Wildlife Research Unit, and their cooperators. Research included monitoring the size and productivity of the largest known breeding colony of Caspian Terns (*Sterna caspia*), on East Sand Island in the Columbia River estuary. This colony

is managed by a group of federal, state, and tribal resource agencies. In addition, we monitored the size and productivity of the largest known colony of Double-crested Cormorants (*Phalacrocorax auritus*), also on East Sand Island.

Several species of seabirds prey on juvenile salmonids in the Columbia River estuary and lower Columbia River, including Caspian Terns, Double-crested Cormorants, Western/Glaucous-winged

Gulls (*Larus occidentalis* X *L. glaucescens*), California Gulls (*L. californicus*), and American White Pelicans (*Pelecanus erythrorhynchos*). Some of the salmonids are listed under the U.S. Endangered Species Act (ESA), and therefore agencies are required to take measures to improve survival of these fish in the river. One focus has been to relocate the principal breeding colony of Caspian Terns in the Columbia River estuary, with the aim of

REPORT - Columbia River terns and cormorants

reducing predation by terns on salmonids. The tern colony was induced to move from its former site on Rice Island to an artificially improved site on East Sand Island, 21 km closer to the ocean. All Caspian Terns nesting in the Columbia River estuary have used East Sand Island since 2001.

In 2006, the size of the Caspian Tern colony on East Sand Island was approximately 9200 pairs (compared to approximately 8820 pairs in 2005). About 6.5 acres of nesting habitat were prepared for the terns on East Sand Island prior to the 2006 nesting season, and terns utilized approximately 4.0 acres for nesting, somewhat less than the 4.5–4.8 acres used in 2002–2005. Juvenile salmonids comprised 32% of the diet of terns at the East Sand Island colony in 2006, compared to 23% salmonids in 2005. Northern anchovy (*Engraulis mordax*) and surfperch (Embiotocidae) were the most prevalent non-salmonid prey in tern diets.

The size of the Double-crested Cormorant colony on East Sand Island in 2006 was approximately 13,280 nesting pairs, compared to 12,290 in 2005. As in 2004 and 2005, attempts to attract cormorants to nest in areas of East Sand Island where no nesting had previously occurred were successful. Methods included habitat modification, decoys, and audio playback systems. Similar attempts to attract cormorants to nest on islands other than East Sand Island also were successful; cormorants produced fledglings

at two sites 21 km and 23 km upriver from East Sand Island (Rice Island and Miller Sands Spit, respectively).

East Sand Island continues to be the largest known post-breeding roost site for endangered California Brown Pelicans (*Pelecanus occidentalis californicus*) on the west coast of the U.S. Upwards of nearly 9000 Brown Pelicans were counted on the island in late July and August.

Much farther upriver, near the confluence of the Snake and Columbia rivers in Eastern Washington, the Caspian Tern colony on Crescent Island was estimated at approximately 450 nesting pairs in 2006, down from 475 in 2005. This colony is the third largest Caspian Tern colony in the Pacific Northwest, after the colonies at East Sand Island, Oregon and on Dungeness Spit, Washington. About 191 fledglings were produced this year, corresponding to a nesting success of 0.4 young raised per nesting pair, the lowest estimate of productivity at Crescent Island to date. Juvenile salmonids comprised 62% of the diet of terns in 2006, similar to diet composition during 2000–2005.

The largest Double-crested Cormorant breeding colony on the mid-Columbia River is on Foundation Island, 9 km upriver from Crescent Island. Cormorants in this colony nest in trees. Numbers have been increasing gradually, and there are now at least 360 nesting pairs, up from about 315 in 2005. The largest Double-crested Cormorant colony

on the inland Columbia Plateau, however, is on Potholes Reservoir, where about 1160 pairs nested in trees at the north end of the reservoir in 2006. This colony was estimated at about 870 nesting pairs in 2005, and is also growing.

This year's research team included Dan Roby of Oregon State University (OSU) and the U.S. Geological Survey; Jessica Adkins, Yasuko Suzuki, Christy Hand, Nathan Hostetter, Don Lyons, and Anne Mary Myers (OSU); Ken Collis, Mike Hawbecker, and Allen Evans (Real Time Research); Bobby Begay (Columbia River Inter-Tribal Fish Commission); and a number of seasonal technicians and volunteers. The interagency Caspian Tern Working Group consists of the National Marine Fisheries Service, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Washington Department of Fish and Wildlife, Idaho Department of Fish and Game, Columbia River Inter-Tribal Fish Commission, and others. This study was funded by the Bonneville Power Administration, the Northwest Power and Conservation Council, the U.S. Army Corps of Engineers, Portland District, and the U.S. Army Corps of Engineers, Walla Walla District.

See www.columbiabirdresearch.org for more information.

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FORUM

The Forum section gives PSG members a place to express their opinions on topics of concern to the group. Viewpoints published here belong to the individual writers and do not represent PSG policy. Another viewpoint on the issue discussed below will appear in *Pacific Seabirds* for Spring 2007.

TAKING MARINE SEABIRD CONSERVATION SERIOUSLY: TOWARDS A STEADY STATE ECONOMY FOR THE PACIFIC AND BEYOND

Falk Huettman and Brian Czech

Every wildlife management textbook states that wildlife is managed through habitat (e.g. Anderson 2002:467, Braun 2005:465 and 489). For most seabirds, habitat management reaches far beyond the cliff of the nesting colony or the breeding site: it also includes the oceans that cover two thirds of the globe. The oceans present a difficult and complex environment for conservation, because the quality of this marine habitat is inherently connected with all of the major ecological processes on earth and across borders; e.g. climate, land cover and human use (Ricklefs and Miller 2000:227, Walther et al. 2002). Secondly, oceans constitute a huge area often without true ownership and policing, an area where seabirds spend months and even years undetected at sea (Schreiber and Burger 2002:3).

The quality of seabird habitat, even upon the oceans, is a direct reflection of the “hinterland” located upstream, which is heavily affected by how humans use the land (Lichatowich 1999; see also GLOBIO Mapping Human Impacts on the Biosphere [<http://www.globio.info>]). Many independent sources and indicators show very clearly that this habitat is degrading on a global scale (e.g. starting with Carson 1951, Boersma et al. 2002, Myers and Worm 2003); thus, our use of land as well as seascapes is anything but sustainable (for the current state of marine environment see the United Nations Environment Programme [<http://www.unep.org/Documents>]). For instance, plastic pollution has been an issue of major and global concern for many years (Furness

1985 for Scotland, Robards et al. 1997, Huettmann unpublished for Russian Far East); toxic pollution levels even in the remote wilderness of the ocean are far from “virgin” (Burger and Gochfeld 2002) and probably increasing. It was actually the nuclear radiation topic in the 1970’s on the remote Aleutian Islands which lead to the founding of Greenpeace, nowadays a global watchdog for environmental protection. Hidden oil pollution (many small spills rather than few publicized large ones) is still on the rise and killing seabirds (Burger 1997, Wiese 2002) as well as many other denizens of the oceans (Norse and Crowder 2005). Meanwhile, dredging the seafloor is occurring at the similar unsustainable rate as harvesting of the tropical rainforest (Thrush and Dayton 2002).

Global fisheries are often identified as some of the best examples of unsustainable economic exploitation of natural resources (Primack 1998:249, Norse and Crowder 2005:183). We are harvesting down the food chain (Bryant 2000, Pauly et al. 2001). Cod, herring, tuna and salmon, and certainly many whale species are just some classic textbook examples where consumption has overcome long-term sustainability (Safina 1997, Harris 1998, Lichatowich 1999).

As a consequence, and as found elsewhere in the world (Wilson 1989), marine biodiversity loss is occurring beyond any reasonable doubt (Mann Borgese 1982, Norse and Crowder 2005). The fact that this has happened so dramatically over the last 50 years is, we believe, tightly linked to global economic growth. Economic

growth is an increase in the production and consumption of goods and services. It entails increasing human populations and/or per capita consumption, and is generally indicated by increasing gross domestic product (GDP). The number of endangered seabird species, as with most other taxa, is also increasing, and the causes of species endangerment read like a “Who’s Who” of the economy (Czech et al. 2000).

Seabirds are responding to the habitat changes mentioned above, and the seabird research community has promoted seabirds as indicators of habitat quality (e.g. Furness and Camphuysen 1997, Schreiber and Burger 2002, Gaston 2004). Seabirds do not only respond with declines and endangerment such as with most albatross species (BirdLife International [<http://www.birdlife.org>], Tuck et al. 2001, Lewison et al. 2004), but some seabirds have increased beyond population levels previously known. For example, Glaucous-winged Gulls in British Columbia have tripled over the last 20 years (Thomassen et al. 2004), and Atlantic Northern Gannets populations are currently “exploding” (OAG 2004 for North Sea). These population declines on one hand and explosions on the other all reflect an overall decline in ecological integrity as a direct response to human economic activity in the ocean and hinterland (Blokpoel and Spaans 1991, Czech 2005). Some seabird communities might very well show similar patterns as those observed globally with Starlings, House Sparrows, Magpies, Crows and Pigeons for instance. If exact causes for drastic

population changes are not known, it is reasonable to suspect human economic activities.

Marine protected areas are being established but need to be expanded and their management improved if they are to have a substantial effect (Boersma and Parrish 1999). One can hardly call this progressive and pro-active conservation and certainly not sustainable adaptive management (Walters 1986). So far, we are catering primarily to the needs of industry and the politically powerful macroeconomic goal of economic growth (Paehlke 2004).

AN ALTERNATIVE: THE STEADY STATE ECONOMY?

The ecological integrity of the Pacific Ocean, including the conservation of its fish (Czech et al. 2004, Rose 2005) and seabirds, and in common with most if not all other ecosystems, declines as a function of economic growth (Czech 2005). Examples can be seen with the situation of coastal salmon and eulachon declines, and the increased endangerment of albatrosses due to fisheries. National and global economies grow as an integrated whole. They consist of agricultural, extractive, manufacturing, and service sectors that require physical inputs and produce wastes. The expanding economic sectors and activities in the interior portions of the United States, for example, are connected to the economic sectors and activities that more directly impact the Pacific Ocean (Lichatowich 1999).

Some assume that economic growth, if resulting from technological progress, will not be harmful to oceans and wildlife; others just wish to ignore the subject altogether. New technology enables a broader niche of the human species and, when used in the service of economic growth, the competitive exclusion of a broader array of non-human-species (Czech 2003). We can ignore the issue if we choose, but let's not be mistaken: "There is a fundamental conflict between economic growth and wildlife conservation" (The Wildlife Society 2003:2), and the Pacific Ocean offers no exception

(Glavin 2000, Diamond 2005).

So what's the alternative? It is actually quite simple, although the politics of achieving it are daunting. It's called the "steady state economy", in which population and per capita consumption are stabilized or mildly fluctuating with environmental conditions (Czech and Daly 2004). The steady state economy is well known among economists, especially ecological economists and environmental economists (Daly 1997). Details on what a steady state economy entails are given for instance by Daly and Farley (2003:54-55) and Czech and Daly (2004), but by no means does a steady state economy entail a violently radical change of life, civilization, or even political institutions. It rather promotes making long-term decisions that halt senseless spending and conspicuous consumption—something that is in everybody's interest. The current efforts toward tracking individual or institutional carbon emissions vs. sequestration is one step in that direction. Ultimately, macroeconomic policy reform may also be required, in which case the same fiscal and monetary policy levers that are currently set for rapid economic growth are gradually reset for a steady state economy.

The steady state economy is already advocated by a growing number of professional societies and conservation organizations (see <http://www.steadystate.org/Links>). For example, the North America Section of the Society for Conservation Biology has adopted a position entitled "The Steady State Economy as a Sustainable Alternative to Economic Growth" (<http://www.conbio.org/Sections/NAmerica> [policy for 16 August 2004]). The American Fisheries Society has held two symposia related to the issue of the Steady State Economy and Fish Conservation, and is considering adopting a position (Biford et al. 2006, Czech et al. 2006). As part of this broader effort, The Wildlife Society's Working Group for the Steady State Economy assists professional societies develop positions and strategies for addressing the conflict between economic growth and environmental protection, as does the Society for

Conservation Biology's Working Group for Ecological Economics and Sustainability Science.

The Pacific Seabird Group deals with species that come from a vast region. Some countries are highly developed while others are not; it may often be practical only in the wealthier nations to adopt a steady state economy in the near future (Czech and Daly 2004). We think that it is time for the Pacific Seabird Group, a group often described as a progressive advocacy group for environmental and sustainability issues in the Pacific (Mudd-Ruth 2005) and dealing with endangered species and species of conservation concern (e.g. Marbled, Kittlitz's and Xantus's Murrelet, Terns, Albatrosses), to address the issue of economic growth by taking a position describing the conflict between economic growth and Pacific seabird conservation. This is important for building solidarity among the natural resources professions toward a balanced welfare of humans and nonhumans alike.

Politicians have been telling citizens for decades, "There is no conflict between economic growth and environmental protection." Therefore, we can't blame citizens for continually advocating economic growth. We can blame only ourselves if we don't join the effort to educate the public and polity on the trade-offs they face (Taber and Payne 2003).

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CONSERVATION REPORT

Compiled by Craig Harrison

NORTHWESTERN HAWAIIAN ISLANDS DECLARED A NATIONAL MONUMENT

The remote islands of Hawai'i are now in the Northwestern Hawaiian Islands Marine National Monument, under a proclamation on 15 June 2006 by President George W. Bush. The monument protects an archipelago that is 1400 miles (2240 km) long and stretches from Nihoa Island, just northwest of Kauai, to Kure Atoll. The area includes a 100-mile (160 km) wide strip of islands, coral reefs, and adjacent deep ocean.

The area is home to 7000 species of birds, fish and marine mammals, a quarter of them unique to Hawaii. These include millions of seabirds, the endangered Hawaiian monk seal (*Monachus schauinslandi*), and sea turtles. The land area is largely uninhabited—the only regular human visitors to the islands are USFWS researchers. Others with interests in the area include Native Hawaiians, because of traditional archeological and religious sites, commercial fishermen, and airlines for which Midway Atoll can provide an emergency runway.

The White House's press release (15 June 2006) says that the National Oceanographic and Atmospheric Administration (NOAA) will oversee management of the national monument, with input from other federal agencies and the state of Hawaii. USFWS will continue to manage wildlife refuges within the monument. Commercial fishing will be phased out during a five-year period. Access to most islands and waters will be restricted to protect natural resources. Access will be permitted for Native Hawaiian cultural activities; and a public visitation center will be maintained on Midway Atoll, in part so that people can see its World War II sites.

Conservationists and biologists have

urging protection of the northwestern Hawaiian Islands for more than two decades (Craig S. Harrison, "A Marine Sanctuary in the Northwestern Hawaiian Islands: An Idea Whose Time Has Come"; *Natural Resources Journal* 25:317, 1985). PSG has long supported the effort, writing three letters to NOAA officials in 1991-1994 and recruiting other conservation groups to help. President Clinton designated the northwestern Hawaiian islands a Coral Reef Ecosystem Reserve in 2000, and he ordered NOAA to begin evaluating the area as a National Marine Sanctuary. NOAA has been working on a draft EIS for a marine sanctuary since 2002 and has held over 100 meetings and public hearings. Hawai'i Governor Linda Lingle (R) has been active in promoting the federal sanctuary (*Pacific Seabirds* 32:14, 2005), and the state established a Northwestern Hawaiian Islands Marine Refuge in fall 2005. The state's rules prohibited commercial and recreational fishing within state waters (out to three miles off shore) and required permits for other activities. President Bush decided to declare the national monument now, rather than wait for the impact statement procedure to finish, because of support from the state of Hawai'i and the public. The conservation community is commending President Bush for his action.

The closure to commercial fishing is still a contentious issue. Kitty M. Simonds, executive director of the Western Pacific Fishery Management Council, stated that the group would fight for continuation of bottom fishing (*New York Times*, 15 June 2006). However, only 8 boats are licensed to fish in the area at present; and fishing in the area could compromise its ecological integrity, including the risk of introducing destructive plants or insects to pristine islands.

There was tourism on Midway Island from 1996 to 2002, and visitor facilities already exist there (V.M. Men-

denhall, *Pacific Seabirds* 28:2, 2001; *Pacific Seabirds* 29:10, 2002). Resuming tourism on Midway could allow a superb environmental education program, and the public could appreciate one of the nation's most spectacular seabird colonies. Visitors also need to see historic artifacts. But it will be crucial to place the highest priority on protection of breeding species and sensitive habitats. When Midway was open to tourism previously, many paths and beaches were closed to prevent disturbance of seabird colonies, sea turtles, and Hawaiian monk seals. PSG will be watching developments in the new national monument with great interest.

EXXON ASKED FOR MORE MONEY TO REMEDY EFFECTS OF EXXON VALDEZ OIL SPILL

The U.S. Department of Justice and the state of Alaska announced on 1 June 2006 that they are seeking another \$92 million from Exxon Mobil Corp. to identify and remove residual oil from shorelines in Prince William Sound and the Gulf of Alaska. The governments are reopening the 1991 settlement of their civil suit against Exxon. A "reopener clause" in the settlement allowed the governments seek up to \$100 million more from Exxon-Mobil if habitats or populations are still impacted in ways that could not reasonably have been anticipated in 1991. A formal demand will be filed by 1 September 2006.

Shoreline surveys conducted during summer 2005 showed that oil from the 1989 Exxon Valdez spill lingers below the surface in areas outside of Prince William Sound, according to a scientific study reviewed at a January 2006 conference in Anchorage (see report on the 2005

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conference in *Pacific Seabirds* 32:16, 2005). The study included parts of Katmai and Kenai Fjords National Parks and found that oil remains trapped beneath boulder-strewn shorelines in the same mousse-like condition as when it arrived there. The study focused on areas outside Prince William Sound, and the authors were surprised to find relatively fresh oil as far away as Katmai, on the Alaska Peninsula about 480 km southwest of the grounding site.

Surveys of remnant oil within Prince William Sound have consistently revealed more oil than expected. Surveys in 2001 of areas that had been heavily oiled led to an estimate that about 55 tons of *Exxon Valdez* oil remained on Prince William Sound beaches, but surveys in 2003 revealed that much more oil remained buried in the lower half of the intertidal zone than was expected. Most recent surveys focused on areas that were lightly oiled, and even they have lingering oil. NMFS concluded in May that about 100 tons of oil still contaminate patches that total almost 10 km of shoreline around Prince William Sound.

In most places, the oil does not appear to pose an immediate danger. For example, even on heavily oiled sites, mussels (*Mytilus* sp.) on the surface above the oil appear to be clean. However, creatures such as sea otters (*Enhydra lutra*) and Harlequin Ducks (*Histrionicus histrionicus*) that dig into shoreline substrates are still at risk of encountering oil if they disturb sediment in search of their prey.

The shorelines' rocky characteristics are ideal for trapping buried oil, because they are not truly beaches in the geological sense. They are not composed of sand that is deposited and eroded by wave action over time, but rather are composed of cobbles and large rocks overlying some sand and a shallow layer of bedrock. The rocky layers lock the oil in place. Among the options to rid the shorelines of lingering oil are excavation and removal to a landfill; use of biological nutrients to help the oil degrade more quickly; and simply letting nature degrade the oil over time.

Some believe that active cleanup of

lingering oil would do more harm than good. Cleanup techniques carry risks, and a 2002 examination of shorelines that were cleaned in 1989 with hot water under high pressure found that populations of clams and mussels remained impaired. Study results indicated that high-pressure hot-water washing did considerable damage to inter-tidal sediments and was worse for bivalve colonies than the oil exposure itself. Those techniques, however, benefited other creatures at the time they were employed.

The recent findings indicate that exposure to *Exxon Valdez* oil continues to have an impact on many shore-dwelling animals and is contributing to their slow recovery in some parts of Prince William Sound. Exxon Mobil questions these conclusions and contends that Prince William Sound has recovered, is healthy and is thriving.

Under the original *Exxon Valdez* settlement that was signed in 1991, Exxon paid \$900 million to state and federal governments over a 10-year period ending in 2001, as compensation for damages caused by the 11 million gallons of oil that spilled when the their tanker went aground on 24 March 24 1989.

PETITION TO REMOVE CALIFORNIA BROWN PELICAN FROM ENDANGERED LISTS

On 14 December 2005, the Endangered Species Recovery Council submitted formal petitions to remove the California Brown Pelican (*Pelecanus occidentalis californicus*) from the list of species covered by the US and California state Endangered Species Acts (ESAs). In late May 2006, the U.S. Fish and Wildlife Service (USFWS) announced that the petition "presents substantial scientific or commercial information" and that delisting "may be warranted" (*Federal Register* 71[100]:29908, 24 May 2006). Under the ESA, USFWS is required to make a final determination by Decem-

ber 2006, and the agency has solicited information on this subspecies and other Brown Pelican subspecies to assist its decision. The state of California has also begun to evaluate the petition.

Since the California Brown Pelican was listed as endangered in 1970, its breeding success has improved greatly and its population has increased. A major factor in this improvement was the prohibition on use of DDT in 1972.

Opinions among biologists vary somewhat on the issue of delisting the California Brown Pelican. All agree that the species is in much healthier condition than in the 1970s. Some believe that conservation efforts in the U.S., as well as in Mexico (where the majority of California Brown Pelicans nest), can continue to protect it well. Other experts are concerned that the pelicans may come under threat from continuing problems, such as limited breeding distribution, impacts from fishing, and changes in the ocean ecosystem. A third option under the ESA, in addition to removing the pelican from the list or retaining its endangered status, would be to "downlist" it—to redesignate it as a threatened species. The Executive Council has requested information and data from various parties, and it will consider its the next meeting whether adopt a PSG policy on the delisting.

MORE SHORT-TAILED ALBATROSSES APPEAR OFF WEST COAST

In late July 2005, Ben Saenz and Jason Yakich recorded an apparent juvenile Short-tailed Albatross (*Phoebastria albatrus*) in the Gulf of the Farallones during a PRBO research cruise due west of Middle Farallon Island at the continental shelf break. A Short-tailed Albatross also was seen on 12 August 2005 out of Monterey on a Shearwaters Journey trip. In September 2005, a juvenile was recovered from Oregon coast that had been banded by Hiroshi Hasegawa as a chick at Torishima Island, Japan on 22 April 2004.

A juvenile also was photographed by Koji Ono in the Santa Barbara Channel during a PSG field trip in February 2002 (*Pacific Seabirds* 29:2, 2002).

Hasegawa notes that the Short-tailed Albatross population on Torishima has increased in numbers at 7.6% per year (doubling in 9.5 years) and is now estimated at about 1,700 birds. The second breeding population in the Senkaku Islands is also increasing, with a population of about 300 birds. With a world population of about 2,000, the species seems to be expanding its marine range.

RECORD ALBATROSS NUMBERS TALLIED AT MIDWAY ATOLL

The USFWS has issued its report on the annual count of Laysan and Black-footed Albatross (*Phoebastria immutabilis* and *P. nigripes*) nests at Midway Atoll National Wildlife. Volunteers carried out the count during a three-week period December 2005 and January 2006. Numbers for both species have increased to the highest levels since the count began in 1991. A total of 511,612 nests were counted. This including the fifth year of increasing Black-footed Albatross numbers, following a minor decline in the 1990s. The total number of nests counted was 487,527 (Laysan Albatross) and 24,085 (Black-footed Albatross).

The 2005-6 count is the 6th complete assessment of Midway's nesting albatrosses in the last fourteen years. Though numbers have fluctuated somewhat from year to year, the previous record nest counts were 441,178 Laysan Albatross nests in 2003 and 21,645 Black-footed Albatross nests in 1996. For reasons that seem based more on theoretical considerations than the status of the population, the International Union for the Conservation of Nature considers Black-Footed Albatrosses to be an "endangered" species. USFWS recently rejected a petition

to list this species as endangered under federal law.

CASPIAN TERN MANAGEMENT UPDATE

PSG, along with the Seattle Audubon Society, American Bird Conservancy, National Audubon Society, Defenders of Wildlife, and Oregon Natural Resources Council wrote USFWS to express concerns over plans to begin dispersal of the Caspian Tern (*Sterna caspia*) colony on East Sand Island in the Columbia River estuary. We asked that the current management efforts to create at least 6 acres of nesting habitat at East Sand Island be continued, without any diminishment in colony size, until a variety of issues have been addressed.

1. No alternative habitat has been established for Caspian Terns that the agency proposes to displace from the East Sand Island colony. While alternate breeding sites such as at Willapa Bay and Gray's Harbor were considered in 1999, no alternative sites have been prepared, even though 77 alternate sites have been identified and evaluated. In addition, in February 2006, NOAA-Fisheries (NMFS) issued a Biological Opinion addressing the impacts that relocating most of the East Sand Island Tern colony would have on salmonid species that are listed under the ESA. Seven alternative sites had been chosen under an environmental impact statement (EIS) on Caspian Tern management. However, NMFS has eliminated all sites listed in the EIS from consideration, except for two in the San Francisco Bay, over 600 miles away from the colony. Without suitable nesting habitat near East Sand Island, no terns should be dispersed.

2. Caspian Tern numbers are stable or declining. The most recent data from researchers at Columbia Bird Research documents that the population in the Columbia estuary has been stable over the last 8 years, not increasing as predicted. The 2005 count of 8,822 pairs of Caspian

Terns on East Sand is 7% below the 2004 numbers of 9,502 pairs and substantially below the 12,000 pairs predicted for 2005 in the EIS.

3. The goals for predation on listed salmonid species have nearly been met. In 2005, the diet of East Sand Island Terns had been reduced to 23% salmonids, down from 74% at Rice Island in 1998. (Terns were dispersed from Rice Island to East Sand Island in an effort to reduce their predation on salmonid smolts.) Consumption of salmonids by the East Sand Island tern colony in 2005 was approximately 3.6 million smolts, about 9.0 million fewer smolts consumed compared to 1998 (71% reduction), when all terns nested on Rice Island. Since tern management actions began in 1999, the overall reduction in salmonid consumption has been more than 36 million salmon smolts.

4. Ownership of East Sand Island is still not resolved. The settlement agreement in the law suit against the U.S. Army Corps of Engineers (COE) stipulated that USFWS and COE were to issue a joint recommendation on future ownership of East Sand Island and also make recommendations for funding of management on the island. This issue remains unresolved, and we urged USFWS to add East Sand Island to the Oregon Islands National Wildlife Refuge.

5. An EIS is required before any management actions on cormorants (*Phalacrocorax* spp).

The annual maintenance of about 6.5 acres of Caspian Tern nesting habitat on East Sand Island was again performed by the COE in late March 2006, and terns have been arriving on the colony site as they normally do at this time of year. Although so far there has been no development of alternative Caspian Tern colony sites outside the Columbia River estuary, as described in the Final EIS, there has also been no reduction in tern nesting habitat on East Sand Island. In addition, three sites in Oregon are still considered possibilities as alternative habitat: Summer Lake, Crump Lake,

and Fern Ridge Reservoir. It is unclear whether the 680-pair colony at the Dungeness National Wildlife Refuge is safe, or whether it can be eliminated as part of the management plan.

IS THE MARBLED MURRELET'S DECLINE LINKED TO FISHERIES COLLAPSE?

Marbled Murrelets (*Brachyramphus marmoratus*) may be feeling the effects not only of losing the coastal forests where they nest to logging. They may also be affected by the disappearance of the high-quality, high-fat foods they rely upon due to overfishing, according to Steve Beissinger, professor of conservation biology at the University of California, Berkeley. His research offers some clues to why murrelets are failing to reproduce successfully. In some years as many as 90 percent of murrelets do not nest. In good years, only about half of the birds nest, and they do not always produce offspring. Researchers suspect the reason may be that murrelets are not ingesting enough nutritious, high-fat food to supply the nutrients and energy needed for successful reproduction.

When murrelets consume less nutritious foods, they spend more time diving to catch and eat them, and consequently they have less energy to produce and lay eggs. Researchers can determine what kinds of food murrelets are eating by analyzing their feathers. Feathers with higher levels of nitrogen isotopes are from birds that have eaten high-fat, high-energy foods such as sardines (*Sardinops*), anchovies (*Engraulis*), and squid. Feathers with higher levels of carbon isotopes are from birds eating less nutritious food sources such as krill (*Euphausiidae*), sand lance (*Ammodytes*), and young rockfish (*Sebastes*).

A comparison of murrelet feathers from 1895 to 1911 with feathers collected between 1998 and 2002 in the same region indicate that a century ago the birds had a much more nutritious diet

compared with modern birds. To rule out changing ocean temperatures as a cause for the differences, the biologists also compared the feathers from older birds and modern birds that had both been gathered during years the ocean was cool, making nutritious prey more abundant. Even when comparing these birds, the researchers found the modern murrelets had eaten 42 percent less high-nutrition prey than the older birds.

The scientists say the new research indicates that conservation efforts need to focus not only on the loss of coastal forests where the birds nest, but also on their prey base. The study was funded by the California Department of Fish and Game and USFWS and was published in the journal *Conservation Biology* (20:297, 2006).

OREGON COUNTY SUES TO REMOVE PROTECTIONS FOR MARBLED MURRELET

Coos County, Oregon, and the Pacific Legal Foundation sued the federal government in February in an effort to force USFWS to remove the Marbled Murrelet from the endangered species list. The county says it has lost economic opportunities because of the listing. At issue is whether the species' smaller Pacific Northwest population is linked with the more robust populations in Canada and Alaska. Some estimates indicate that there are about 17,000 to 20,000 murrelets living off the coasts of California, Oregon and Washington, compared to nearly 1 million in Canada and Alaska. Currently the Pacific Northwest murrelet is protected under the ESA because the population is considered to be a distinct segment.

The plaintiffs argue that the two populations are linked and that therefore the Pacific Northwest birds should not have special protection. There has been conflict in the federal administration on whether the Pacific Northwest population

is indeed different from that in British Columbia and Alaska. Regional scientists have said the populations are separate and warrant ESA protection, but the agency's official announcements have been that the birds do not meet the standard for listing as a distinct population segment. FWS officials announced in late 2005 that FWS would consider delisting the bird in 2006.

ANTS ATTACKING SEABIRDS ON ISLETS OFF OAHU

Mokoli'i Island, better known as Chinaman's Hat, hosts a colony of Wedge-tailed Shearwaters (*Puffinus pacificus*) off the windward shore of Oahu. But the birds are driven away by hordes of fast-moving insects called yellow crazy ants (*Anoplolepis gracilipes*), which has caused a dramatic drop in the number of shearwaters that are laying eggs. The ants are a non-native species from Africa. They don't bite, but they excrete an acid which seems to harass the birds sufficiently that they abandon their nesting efforts. Until recently, this island was plagued by introduced ship rats (*Rattus* sp.), which have been eliminated by poisoning. The removal of the rats has allowed more vegetation to flourish on the island, but this may have facilitated eruption of the non-native predaceous ants.

FIJI JOINTS RAT RACE

A team from New Zealand will begin a BirdLife Fiji Program project to eradicate rats on Vatuira Island, which holds internationally important seabird colonies and has been identified as an Important Bird Area. This is the second rat eradication that will be carried in Fiji in 2006; the other is the removal of rats on Viwa Island by a team from the University of the South Pacific. Rats

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are a serious threat to the native birds and wildlife in Fiji and other Pacific islands. Three species of rats have been introduced to Fiji. The Pacific rat (*Rattus exulans*) arrived thousands of years ago, and Norway and black rats (*Rattus norvegicus* and *R. rattus*) more recently. All have had devastating impacts on the biodiversity of Pacific islands and have led to the extinction of innumerable island species.

PSG COMMENTS ON LUCKENBACH OIL SPILL

PSG commented on the draft Restoration Plan/Environmental Assessment for the oil spill from the *Jacob Luckenbach* and associated mystery spills, which was issued in February 2006. The restoration plan proposes to spend oil-spill restoration funds for damage to seabirds and other natural resources related to multiple oil spills that occurred off the coast of San Francisco from 1990 to 2003.

PSG generally supported the plan. It endorsed the following projects: (1) protection of nesting habitat of nesting Pacific Loons (*Gavia pacifica*), Red-throated Loons (*Gavia stellata*), and Red Phalaropes (*Phalaropus fulicaria*) at Kokechik Flats, Alaska; (2) protection of Western/Clark's Grebe (*Aechmophorus occidentalis* and *A. clarkii*) nesting colonies at northern California lakes; (3) mouse eradication at the Farallon Islands to benefit nesting Ashy Storm-Petrels (*Oceanodroma homochroa*); (4) seabird restoration on Baja Islands to benefit Cassin's Auklets (*Ptychoramphus aleuticus*), California Brown Pelicans, and cormorants; (5) extending the current seabird colony protection program for Common Murres (*Uria aalge*) off the central California coast by 20 years; (6) a corvid management at Point Reyes National Seashore to improve nesting success of Common Murres; (7) restoration of the Reading Rock murre colony in Humboldt County, California; (8) a corvid management program in the Santa

Cruz Mountains of California to improve Marbled Murrelet nesting success; (9) old-growth forest acquisition and protection to benefit Marbled Murrelets; (10) dune habitat restoration at Point Reyes National Seashore to create more nesting habitat for Snowy Plovers *Charadrius alexandrinus*; (11) Norway rat eradication in the Queen Charlotte Islands, Canada, to benefit Ancient Murrelets (*Synthliboramphus antiquus*); and (12) nesting habitat restoration on Año Nuevo Island, California to benefit Rhinoceros Auklets (*Cerorhinca monocerata*).

PSG also noted that the seabird project at three important breeding colonies of the Xantus's Murrelet (*Synthliboramphus hypoleucus*)—San Martín, San Jeronimo, and the San Benito Islands—would benefit that species, which the trustees did not find was injured by the spills.

SUCCESS IN THE GALAPAGOS

Project Isabela reports that it has met all of its objectives and that northern Isabela Island, Galapagos Islands, is free of goats, pigs and donkeys. In 1997 there were between 100,000 and 150,000 goats in an area of around 250,000 square kilometers on north Isabela. This highly ambitious project has been an initiative of the Galapagos National Park and the Charles Darwin Foundation for the Galapagos Islands.

For more information please view <http://www.hear.org/galapagos/invasives/topics/management/vertebrates/projects/pi.htm>

WILL THE ENDANGERED SPECIES ACT BE AMENDED?

The chairman of the U.S. Senate Environment and Public Works Committee intends to rewrite the ESA, despite the failure of a consultation group to reach

consensus on a key habitat provision. James Inhofe (R-Okla.) said that the Senate should complete the legislative process that was begun last year in the House. The nonprofit Keystone Center had been commissioned to convene environmentalists and representatives of the commercial sector to find consensus on ESA habitat issues. The Keystone group supported legislative changes to ESA, but it could not reach agreement on the contentious issue of critical habitat. It did recommend elevating the role of the recovery plans that are required for each endangered species to become the central management tool for those species. It also said changes are needed in the incentives that encourage landowners to conserve habitat, and in a consultation process that currently discourages many landowners from coexisting with listed species on their land.

The ESA now requires federal officials to designate critical habitat for each species when it is listed. USFWS rarely does this, which has been the focus of many lawsuits. Some environmental groups hold up critical habitat as crucial for species survival, but USFWS officials in current and past administrations have said it is one of the most expensive and least useful parts of the act. The bill that House Resources Committee Chairman Richard Pombo (R-Calif.) brokered through the House floor in autumn 2005 rescinded the critical habitat requirement in favor of voluntary recovery plans. Many environmental organizations object to the House bill.

A report on the ESA by the independent Government Accountability Office (GAO) appears to rebut some of Pombo's criticisms. Pombo has argued the ESA's recovery rates are "abysmal" because less than 1 percent of species have been delisted. The GAO report said that the ESA's success rate "is difficult to measure" because some species are not likely to recover for 50 years or more. "Simply counting the number of extinct and recovered species periodically over time, without considering the recovery prospect of listed species, provides limited insight into the overall success

CONSERVATION REPORT

of the services' recovery programs," the report said.

The GAO recommends that federal officials estimate in recovery plans when recovery may be achieved and what it may cost. The lack of such estimates makes it difficult to measure the success of the ESA. In examining current recovery plans, the GAO found that over 70 percent lacked estimates on when a species might recover, and that few have cost estimates. It recommends USFWS report time and cost estimates in its annual Endangered Species report to Congress. USFWS service officials said they would add "general estimates" of time and cost in their 2006 report.

BRITISH COLUMBIA RENEWS PUSH FOR OFFSHORE EXPLORATION

Hoping to take advantage of all-time high oil prices, British Columbia is trying to persuade the Canadian government to lift a 34-year ban on offshore oil and gas exploration. British Columbia Energy Minister Richard Neufeld said that there may be an estimated 10 billion barrels of oil and 40 trillion cubic feet of natural gas in deposits off the Queen Charlotte Islands. The new Conservative federal

government of Prime Minister Stephen Harper says it has no plans to alter the federal moratorium on offshore drilling, according to the Natural Resources Minister Gary Lunn. Before joining the federal cabinet in early 2006, Lunn favored drilling but said that more precise estimates on British Columbia's potential are needed.

UNDERSEA CABLE TO TRANSPORT WIND POWER FROM OREGON TO CALIFORNIA

Pacific Gas & Electric may build a \$1 billion undersea cable to transport hydroelectric and wind power to California from the Pacific Northwest. The cable would facilitate the development of wind turbines that might impact seabirds and other marine wildlife. The cable would begin north of Portland, Oregon, and would be buried about three miles offshore. The plan would reduce the need for new power plants and meet the 2010 deadline by which California utilities must generate 20 percent of their power from renewable fuel sources. The cable would have the capacity to transport 1,600 megawatts of power to the San Francisco Bay Area, enough for 1.2 million homes. Canadian developer Sea

Breeze Power would lay the undersea cable, which was initially intended to provide a link from British Columbia wind farms to California's high demand for renewable energy. The cable would be the longest underwater electric cable ever constructed.

THEY CAME TO DO GOOD, AND ARE DOING VERY WELL

Annual salaries of senior officials of conservation are available to the public, and from time to time PSG reports them (for a previous report see *Pacific Seabird Group Bulletin* 19:52, 1992). Of interest are these: John H. Adams, President of the National Resources Defense Council, \$704,796; Steven Sanderson, CEO of the Wildlife Conservation Society, \$495,422; Mark Van Putten, President of the National Wildlife Federation, \$477,138; Steven McCormick, CEO of The Nature Conservancy, \$399,788; John Flicker, President of National Audubon Society, \$362,237; Peter Seligmann, CEO of Conservation International, \$336,335; Russell Mittermeier, President of Conservation International, \$331,515; Kathryn Fuller, President, World Wildlife Fund, \$310,781. For the record, PSG's chair earns \$000,000.

PSG NEWS

PACIFIC SEABIRDS WILL GO MOSTLY ELECTRONIC

Starting in 2009, *Pacific Seabirds* will be mailed *only* to those members who specifically *request* it. All members who do not request a hard copy of *Pacific Seabirds* via mail will be able to download each issue from the PSG website, www.pacificseabirds.org

Volume 34 (2007) and Volume 35 (2008) will continue to arrive in the mail as usual, in addition to being posted on the website. *Any member who wants to continue receiving paper copies by mail after 2008 should contact the Treasurer, Ron LeValley; e-mail ron@madrivervio.com; phone (707) 326-0300; address Mad River Biologists, 920 Samoa Blvd., Suite 210, Arcata, CA 95521, USA.* The paper and electronic versions of the journal will still look the same.

The PSG Executive Council decided in favor of distributing *Pacific Seabirds* electronically because a number of journals already are electronic (including our other journal, *Marine Ornithology*), and because the change will save printing and mailing costs. Some people prefer to receive their journals online. However, we will continue to send *Pacific Seabirds* through the mail on request, because some members cannot get it over the Internet conveniently or may just prefer a paper copy.

Libraries will automatically continue to receive *Pacific Seabirds* through the mail (since this can be important for reliable archiving).

PSG ELECTION RESULTS FOR 2007

The following Executive Council members were elected for 2007:

Officers

- **Chair-Elect:** Doug Bertram
- **Secretary:** Mark Hipfner

- **Vice-Chair for Conservation:** Craig Harrison

Regional Representatives:

- **Canada:** Ken Morgan
- **Southern California:** Dan Robinette
- **Washington and Oregon:** Don Lyons
- **Non-Pacific U.S.:** Melanie Steinkamp

PSG INITIATES CONSERVATION SMALL-GRANT PROGRAM

PSG has established a Conservation Small-grant Program for seabird conservation in developing nations of the Pacific. PSG believes that seabird conservation has been handicapped by the difficulty of obtaining small grants, especially in developing nations.

The new program is intended to provide grants for seabird conservation and restoration activities. Funding preferentially will go to citizens of developing countries within or bordering the Pacific Ocean. Normally grants will not be given to citizens of the USA, Canada, Japan, Australia, New Zealand, Mexico, South Korea, or Taiwan (because somewhat more money is generally available in those countries). Exceptions may be made for work that will be conducted in developing countries, if no local citizens are currently able to do the work, and if people in the host country will be participating and learning techniques of seabird conservation; other conditions will also apply.

The size of grants usually will be between US \$250 and US \$2000. Money is expected to come from donations; it may sometimes be supplemented by the grant committee's own fundraising and from PSG's funds. A committee that currently has five members, including Commit-

tee Coordinator Robert Day and PSG's Conservation Chair Craig Harrison, will administer the grant program.

The purpose of the grants is to support actual conservation actions. Examples of actions that PSG hopes to support include:

- removal of invasive species from a nesting colony
- training local residents to reduce impacts of human activities on seabirds or their colonies
- teaching fishermen how to reduce seabird bycatch
- surveys of areas where seabird colonies are not well known, to evaluate the status of populations and their conservation needs
- other projects with similar goals

Some types of seabird work cannot be funded under this program, even though they may provide important information for seabird conservation. Examples that cannot be funded include:

- travel to meetings of PSG or other societies
- regular monitoring or censusing of colonies
- research on seabird breeding biology
- research that includes the purchase of satellite- or radio-telemetry tags

Anyone interested in PSG's Conservation Small-grants Program should contact Robert Day (bday@abrinc.com) and Craig Harrison (charrison@hunton.com). The person should briefly explain the proposed project and where the work will be done. If Day and Harrison recommend that you should apply for a grant, go to www.pacificseabirds.org and click on "Grants" for an application form and full instructions.

Each person who receives a grant will be required to submit short report in English at the end of the year, explaining the activities that were proposed, what was actually accomplished, species and numbers of seabirds included, conserva-

tion benefits to seabirds, expenditure of funds, and suggestions for future work.

Further details are available at www.pacificseabirds.org

PSG'S TRAVEL AWARDS PROGRAM REVISED

The Pacific Seabird Group offers limited travel assistance to a select group of members to attend its Annual Meetings. PSG's health and vitality, now and in the future, depend on the involvement of young people who are undergoing training, and on members from variety of nations around the Pacific. Attendance at PSG's Annual Meetings benefits the exchange of information among all members. PSG recognizes that young scientists and managers who are training at universities may not have enough money to attend Annual Meetings without help. In addition, scientists and managers from nations other than the US and Canada also may have difficulty in attending Annual Meetings without some funding support.

During 2005 and 2006, the Executive Council of PSG revised the Travel Awards program to offer awards in three categories: (1) students from US and Canadian academic institutions; (2) students from academic institutions outside the US and Canada; and (3) scientists/managers (non-students) from nations other than the US and Canada.

Each award category will be funded from a separate source. US and Canadian Student Awards will come from the preceding year's Silent Auction (which is organized by students, under leadership of the Student Representative). Non-US/

Canada Student Awards will be funded from grants and donations raised by the Awards Committee. Non-US/Canada Scientist/Manager Awards will be funded by each meeting's Local Committee, out of registration fees and other funds raised by that committee.

The Travel Awards program is administered by the Awards Committee, whose members are PSG's Past Chair (committee coordinator), the current PSG Chair, and the Chair-elect. The Awards Committee accepts applications for each category, decides who will receive awards in each year, and may adjust the division of money among the three funds.

It is anticipated that each fund will have about US\$2000 per year. Awards will usually be 50% or less of an applicant's cost to attend the meeting. Checks for the awards will be given to recipients during the Annual Meeting (unless the person would be unable to attend the meeting without receiving the money beforehand). More information will be posted on PSG's web site, www.pacificseabirds.org, before each Annual Meeting.

SPECIAL PSG MEETING IN TAIWAN, OCTOBER 2007

PSG is holding a Special International Meeting in Lugang, Taiwan, Republic of China on 4-7 October 2007. This meeting is in addition to the regular PSG Annual Meeting (see next news item). Themes of the International Meeting are "Seabirds as Marine Animals," "Human impacts on seabird populations," and "Seabird status and distribution in the Pacific and adjacent seas." Workshops and

general paper sessions also are planned. There will be over twenty invited and plenary speakers.

Co-sponsors are the Taiwan International Birding Association, The Council of Agriculture, The Ministry of Foreign Affairs, The National Changhua University of Education, and The Taiwan Sustainable Ecology Society.

Lugang is on the west coast of Taiwan. The island has a diverse environment, with mountains and forests, temperate and tropical climates, extensive protected areas, and high endemism. Its culture and history also are interesting and diverse, and Lugang is an ancient cultural center. Several field trips are planned to areas of natural and cultural importance.

For more information, or to arrange a symposium or workshop, contact Tony Gaston (Scientific Chair), tony.gaston@ec.gc.ca, telephone (613) 998-9662; or Ron Ydenberg, ydenberg@sfu.ca, telephone (604) 291-4282. Chair of the local organizing committee is W.L. Wang (wlwang@cc.ncue.edu.tw). Further information and updates will be posted at www.pacificseabirdgroup.org

PSG'S 2008 MEETING TO BE BLAINE, WASHINGTON

PSG's 35th Annual Meeting will be at the Semi Ah Moo Resort, Blaine, Washington, 27 February to 2 March 2008. The Scientific Chair will be Doug Bertram; the Local Organizing Committee will include Tom Good (Chair), George Divoky, Lora Leschner, and Julia Parrish. Further information and updates will be at www.pacificseabirdgroup.org

REGIONAL REPORTS

Regional reports summarize current seabird work of interest to PSG members. Regional Reports generally are organized by location of the work, not by affiliation of the biologist. They should not be cited without permission of the authors.

ALASKA

Compiled by **Shiway Wang**

BEAUFORT SEA

George Divoky (University of Alaska Fairbanks and Friends of Cooper Island) and **Britt Harter** (University of Manitoba) conducted research on the chronology, success and trophics of the Arctic Terns (*Sterna paradisaea*), Black Guillemots (*Cephus grylle*), Horned Puffins (*Fratercula corniculata*) and Sabine's Gulls (*Xema sabini*) breeding on Cooper Island. Detailed information on prey returned to guillemot nestlings was obtained during the period of ice retreat, some of which will be used for a Master's thesis that Harter is completing with **Gail Davoren** at the University of Manitoba. Time-lapse and motion sensitive cameras were also used to examine temporal variation in colony attendance, chick provisioning and fledging.

Steve Johnson of LGL Ltd. (Sidney, British Columbia) writes that his firm, in association with LGL Alaska Research Associates, was involved in several marine mammal projects in the Chukchi, Bering, and Beaufort seas, during which they opportunistically collected marine bird data.

ALASKA NORTH SLOPE

Nora Rojek (USFWS) coordinated monitoring of threatened Steller's eiders (*Polysticta stelleri*) at Barrow. She was assisted by **Jewel Bennett, Jessica Eden, Sonja Jahrsdoerfer, Ted Swem, Neesha Wendling**, volunteers **Carlo Acuna, Rebecca DeKay, Dean Kildaw, Gerry Krausse, Kathryn Peiman, Katie Weber, Adele Young**, and Barrow high school student interns **Uinniq Ahgeak, Alice Anne Fournier, Sean Gueco, and Siggy Patterson**. Study components included a breeding pair survey, nest

searches, nest and brood monitoring (nests were found for a second year in a row), and placement of digital cameras on active nests to monitor predation or other causes of failure. Nest success was high (15 of 16 monitored nests hatched), and several hens were known to fledge young this year.

Research projects involving captive Steller's Eiders, laboratory, and field studies were carried out by **Tuula Hollmen**, of the Alaska SeaLife Center (ASLC) and University of Alaska Fairbanks, ASLC sea duck research staff **David Safine, Ann Riddle, Rebekka Federer**, and graduate students **Abbie Ellsworth, Mary Bozza, and Chris Latty**. They focused on reproductive physiology, disease ecology, nutrition, and diving physiology. They completed a pilot study using artificial incubation techniques to enhance nest survival. ASLC husbandry staff **Heidi Cline** and **Tasha DiMarzio** and collaborator **Arnold Schouten** also participated.

Karen Laing (USFWS) continued to work with the Eider Recovery Team on recovery actions for threatened Steller's and Eiders and Spectacled Eiders (*Somateria fischeri*). A study of blood lead levels in eiders on the North Slope was conducted by **Angela Matz** (USFWS) and **Declan Troy** (TERA, Inc.).

Biologists of ABR, Inc.—Environmental Research & Services (ABR) continued numerous studies of sea duck status on the North Slope. **Bob Ritchie** and **J.J. Frost** conducted aerial and ground surveys for Spectacled and Steller's Eiders at several U.S. Air Force Long-range Radar sites. Ritchie and **Jim King** continued their annual aerial survey for breeding Steller's Eiders in the Barrow region for the Bureau of Land Management, North Slope Borough, and ConocoPhillips, Alaska, Inc. **Rick Johnson**

completed the second year of surveys for breeding Steller's Eiders in the vicinity of the Barrow International Airport for the Alaska Department of Transportation and Public Facilities. This study required locating and monitoring any active nests to determine possible disturbance by airport construction activities.

Betty Anderson and **Rick Johnson** of ABR completed the 14th year of aerial surveys for prenesting eiders on the Arctic Coastal Plain for ConocoPhillips, Alaska, Inc. These surveys enumerate and map locations of Spectacled, King (*S. spectabilis*), and Steller's Eiders in the oilfields between the Kuparuk River and the northeastern National Petroleum Reserve—Alaska. Johnson also continued the second year of a study of the effects on breeding Spectacled Eiders near a new drill site on the outer Colville River Delta (funded by ConocoPhillips Alaska, Inc.). This study employed time-lapse cameras and thermistored eggs to monitor disturbance and nesting success of breeding females using habitats near the drill site, where construction activities are occurring. Anderson continued her long-term study in the Kuparuk Oilfield for ConocoPhillips Alaska, Inc. on breeding Spectacled Eiders. Besides surveys for prenesting eiders in the oilfields, nesting females were monitored for nesting success and incubation constancy with thermistored eggs.

Ritchie, Anderson, and Johnson of ABR continued their annual aerial survey for brood-rearing Brant (*Branta bernicla*) on the Arctic Coastal Plain. This survey covered the coast between Prudhoe Bay and Barrow and enumerates brood-rearing geese and maps use of coastal salt marshes by geese. Funding is from the North Slope Borough and ConocoPhillips Alaska, Inc.

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CHUKCHI SEA

Annual seabird monitoring was conducted at Cape Lisburne by Alaska Maritime National Wildlife Refuge (AMNWR). **Dave Roseneau** and **Jim Schneeweis** evaluated reproductive success and population trends of Black-legged Kittiwake (*Rissa tridactyla*) and Common and Thick-billed Murre (*Uria aalge* and *U. lomvia*).

BERING SEA

Ian Rose (Oregon State University and USFWS) led the summer seabird monitoring crew on St. Lawrence Island, assisted by **Marcy Okada**, **Melinda Connors**, and Savoonga resident **Felix Wongittilin**. This was the seventh consecutive season of seabird monitoring on the island. They concentrated on five species of seabirds, including Least Auklets, Crested Auklets (*Aethia cristatella*), Common and Thick-billed Murres, and Black-legged Kittiwakes. Reproductive success appeared to be relatively poor for St. Lawrence Island seabirds, possibly because of late sea ice retreat. In addition, **Lisa Sheffield** (USFWS) led crews in spring and fall to monitor for H5N1 avian influenza in both live and subsistence-hunted birds, including seabirds.

Kim Nelson, Oregon Cooperative Fish and Wildlife Research Unit at Oregon State University (OSU), continued her research on the traditional ecological knowledge of seabirds and marine mammals at King Island in the Bering Sea. Cooperators were **Deanna Kingston** and **Jesse Ford** (OSU) and other scientists from University of Alaska Fairbanks, Bering Straits Corporation, GeoArch Alaska, and Talking Circle Media. Nelson continued to collect information from the King Island elders about land birds, seabirds, and marine mammals. A list of birds known to be present on King Island has been compiled. Boat surveys of the cliff colonies and mapping of the auklet colonies are on-going. This project is funded by the National Science Foundation.

Art Sows (AMNWR) coordinated monitoring of seabirds on the Pribilof Islands and continued to oversee the

land-based rat prevention program. On St. George Island, **Ram Papish**, **Corntney Pylant** and **Jade Cash** recorded timing of nesting events, reproductive success, and food habits of Red- (*Rissa brevirostris*) and Black-legged Kittiwakes and Common and Thick-billed Murres, and survival of kittiwakes. Ram Papish continued a study of survival of Least Auklets (*Aethia pusilla*), including banding and resighting birds at the Ulakaia colony. On St. Paul Island, **Greg Thomson** and **Monica Farmer** monitored timing of nesting events, reproductive success, and food habits of Red- and Black-legged Kittiwakes and Common and Thick-billed Murres. Greg Thomson led a seabird survey at Walrus Island in the Pribilofs, where he was particularly interested in the impacts of arctic foxes (*Alopex lagopus*) on the distribution of birds.

In Bristol Bay, **Diane Calamar Okonek** and **Brian Okonek** of the Alaska Department of Fish and Game (ADF&G) monitored Black-legged Kittiwake, Common Murre, and Pelagic Cormorant (*Phalacrocorax pelagicus*) populations and productivity at Round Island within the Walrus Islands State Game Sanctuary. **Joe Meehan**, **Marian Snively** (ADF&G), **Deb Rudis** of the U.S. Fish and Wildlife Service (USFWS), and volunteers **Andy Reeves** and **Laura Kruger** surveyed nesting populations of Black-legged Kittiwakes, Common Murres, Pelagic Cormorants, Double-crested Cormorants (*P. auritus*) and other seabirds throughout the Walrus Islands State Game Sanctuary and all colonies in the northern Bristol Bay area.

A range of studies is underway by **Jim Lovvorn** and his students at the University of Wyoming. Work on Spectacled Eiders (*Somateria fischeri*) and their food webs on their wintering area in the Bering Sea continued with an icebreaker cruise in May 2006, with another planned for June 2007. Graduate students **Jason Kolts** and **Chris North** are studying the densities and diets of crabs, sea stars, and snails that may increasingly compete for food with eiders as water temperature rises and these other predators expand

northward. **Eric Anderson** is working under Lovvorn on field studies of scoters (*Melanitta* spp.) in Alaska and Washington [see regional report for Washington and Oregon].

Continued banding efforts of Steller's eiders were led by **Kristine Sowl** and colleagues at Izembek National Wildlife Refuge, on the western Alaska Peninsula.

YUKON DELTA

Several studies on eiders were conducted on the Yukon Delta: an ongoing long term study of breeding biology and annual survival of Spectacled Eiders at Kigigak Island by Bryce Lake of the Yukon Delta National Wildlife Refuge. Dan Rosenberg (ADF&G) studied migration of Steller's Eiders; annual eider surveys were conducted at Kuskokwim Shoals on the Yukon Delta by biologists in the Division of Migratory Bird Management, USFWS, and **Paul Flint** of the U.S. Geological Survey (USGS). A study of fox predation and population dynamics on the Yukon Delta was conducted by **Mike Anthony** and colleagues of USGS. Disease ecology studies in Steller's and Spectacled Eiders and other sea duck species in southwest Alaska were conducted by Tuula Hollmen and her colleagues at ASLC.

ALEUTIAN ISLANDS

Jeff Williams (AMNWR) coordinated long-term seabird monitoring at Aiktak, Kasatochi, and Buldir Islands and other studies in the archipelago.

John Piatt and **Marc Romano** (USGS), **Kathy Kuletz** (USFWS), Jeff Williams, and others conducted surveys for Kittlitz's and Marbled Murrelets (*Brachyramphus brevirostris* and *B. marmoratus*) around Adak Island in the central Aleutians. Ten Kittlitz's Murrelet nests were incidentally located by **Robb Kaler** (University of Kansas) and **Leah Kenney** on Agattu Island, while they were working on a Master's project on Rock Ptarmigan. Previous to this time, no more than one Kittlitz's nest had been found in any given year.

At Aiktak Island in the eastern

REGIONAL REPORTS - Alaska

Aleutians, **Tyra Zeman** and **Joel Helm** monitored timing of nesting events, reproductive success, food habits, and population size of Glaucous-winged Gulls (*Larus glaucescens*), Black Oystercatchers (*Haematopus bachmani*), Tufted Puffins (*Fratercula cirrhata*), Ancient Murrelets (*Synthliboramphus antiquus*), and Leach's and Fork-tailed Storm-Petrels (*Oceanodroma leucorhoa* and *O. furcata*). Also in the eastern Aleutians, Bob Day (ABR) continued work related to the impacts of proposed airport modifications at Dutch Harbor on wintering birds, especially threatened Steller's Eiders.

There are 3 monitoring sites in the central Aleutians: Kasatochi, Ulak, and Koniugi Islands. On Kasatochi, **Brie Drummond** and **Maureen McClintock** primarily studied Least and Crested Auklet productivity, chick growth, food habits, attendance patterns, populations and adult survival rates. They also monitored population levels of Pigeon Guillemots (*Cephus columba*), Pelagic and Red-faced (*Phalacrocorax urile*) Cormorants, and Leach's and Fork-tailed Storm-Petrels. At nearby Ulak Island, populations and productivity of burrow-nesting seabirds were monitored, and cormorant and murre population levels were recorded.

Heather Renner (AMNWR) and **Joel Reynolds** (USFWS) spent three weeks mapping the large auklet colony on Segula Island in May and June. **Ian Jones** of Memorial University of Newfoundland (MUN) and **Kirk Hart** were on Gareloi Island from June to August mapping the auklet colony there. **Brie Drummond** (Dalhousie University and AMNWR) completed fieldwork for her master's project comparing burrow- and crevice-nesting Fork-tailed Storm Petrels on Kasatochi Island.

At Buldir Island in the western Aleutians, technicians **Rachel Orben**, **Corey Van Stratt**, and **Stephan Lorenz** conducted the 19th year of annual seabird monitoring. Species monitored included Red- and Black-legged Kittiwakes, Common and Thick-billed Murres, Least, Crested, Whiskered (*Aethia pygmaea*),

and Parakeet (*A. psittacula*) Auklets, Pelagic and Red-faced Cormorants, and Leach's and Fork-tailed Storm-Petrels. For most species, timing of nesting events, productivity, food habits and population levels were monitored.

Terry Schick, **J.J. Frost**, **Matt Macander**, and **Jenna Boisvert** (ABR) started a study to identify and map habitats used by migratory Aleutian Cackling Geese (*Branta hutchinsii leucopareia*) in the Near Islands (Attu, Agattu, Shemya, and Nizki-Alaid islands), western Aleutians. Current research is focused on Shemya and Attu islands, where fall migrating geese are being observed in 2006. A habitat map will be prepared for Attu Island. The U.S. Air Force is funding this project to help identify potential habitats on other islands, determine their carrying capacity, and encourage continued recovery of this recent delisted species. **Scott Hatch** and **Andy Ramey** (USGS) visited Attu Island in May to implant satellite transmitters in nesting cormorants—two each in Red-faced and Pelagic Cormorants, with the objective of determining the wintering areas of birds from depleted populations in the Near Islands.

INTRODUCED PREDATORS ON THE ALEUTIANS

A team from Island Conservation and The Nature Conservancy, led by **Greg Howald** and **Steve McLean** respectively, conducted a rat eradication trial on small islands near Adak, broadcasting rodenticide by hand. This is another step toward ultimate eradication of rats on selected islands in the Aleutians, in order to restore seabird populations. The effect of Norway rats (*Rattus norvegicus*) on auklet populations of Kiska Island was studied by **Cari Eggleston**, **Johanne Dusurreault**, and **Krista Shea** (MUN), as part of an ongoing investigation.

Steve Ebbert (AMNWR) led a project to recheck Tanaga Island for introduced arctic foxes. Trapping was conducted on the island in previous years to remove foxes. They also conducted initial trapping on islands in the Sanak Group, in cooperation with the Sanak Corporation.

GULF OF ALASKA

In the Semidi Islands, **Heather Renner** coordinated seabird monitoring for AMNWR. **Lucretia Fairchild** and **Claudia Mischler** lived on Chowiet Island in the Semidis from May to early September, monitoring timing of nesting, reproductive success, food habits and populations size for Glaucous-winged Gulls, Black-legged Kittiwakes, Common and Thick-billed Murres, and Rhinoceros Auklets (*Cerorhinca monocerata*).

Coordinated surveys of seabird breeding and foraging were conducted by **Don Dragoo** and **Jeff Williams** (AMNWR), **Martin Renner** of the University of Washington (UW), **John Piatt**, **Kirsten Bixler** and **Erica Madison** (USGS), **Nancy Naslund**, **Mayumi Arimitsu**, **Kitty Mecklenburg**, **Brenda Holladay**, and **Jeff Anderson** (USFWS). The Seabird, Marine Mammal, and Oceanography Coordinated Investigation (SMMOCI) is a multi-year project with transects near seabird colonies where simultaneous nest monitoring is being conducted, in order to evaluate the relationship of seabird foraging to breeding success. In late July, Vernon Byrd, Jeff Williams and **Sue Schulmeister** (AMNWR), and **Catherine Berg** (USFWS), **Judy Alderson** of the National Park Service (NPS) and **Kirsten Bixler** conducted a six-day survey of seabirds breeding in the Shumagin Islands.

At East Amatuli Island in the Barrens group, **Arthur Kettle**, **Megan MacClellan**, **Emily Weiser**, and **Kathryn Peiman** (AMNWR) monitored reproductive success, prey, and population trends of Fork-tailed Storm-Petrels, Black-legged Kittiwakes, Common and Thick-billed Murres, and Tufted Puffins. Population data were also gathered for Glaucous-winged Gulls.

In Cook Inlet, **Leslie Slater** (AMNWR) monitored Black-legged Kittiwake productivity at Chisik and Duck Islands in Cook Inlet during a short visit. **Bob Day** and **Adrian Gall** (ABR) conducted the final year of monitoring of the distribution and abundance of seabirds and marine mammals in Iliamna and Iniskin

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Bays, Lower Cook Inlet, as part of pre-development studies for the proposed Pebble Copper Mine. Day, Gall, and **Ann Wildman** (ABR) monitored the distribution and abundance of seabirds and marine mammals in upper Cook Inlet as part of pre-development studies for the proposed Chuitna Coal Mine. **Kathy Kuletz** completed the final season of a 3-year study of marbled and Kittlitz's murrelets (*Brachyramphus marmoratus* and *B. brevirostris*) and other marine birds in Kachemak Bay, lower Cook Inlet. At-sea surveys and CTD casts were conducted by Kuletz, **Karen Breneman**, **Elizabeth Labunski**, **Tamara Mills** (USFWS), and volunteers. A final report on the decadal changes, current population status, and marine habitats used by each murrelet species will be available by mid-2007.

Ann Harding (USGS and Alaska Pacific University) continued to work with John Piatt on publications stemming from the Cook Inlet seabird project, focusing on the functional relationship between Common Murre behavior and prey density. Bob Day and **Alex Prichard** (ABR), and **Tom Weingartner** of the Institute of Marine Sciences, UAF, are synthesizing information for a manuscript about oceanography and the distribution and abundance of seabirds in the northern Gulf of Alaska in winter, as part of the GLOBEC program.

Harlequin Ducks (*Histrionicus histrionicus*) were studied for the third year by **Denny Zwiefelhofer** Kodiak National Wildlife Refuge (KNWR). The radio telemetry project is being conducted in the Karluk watershed of KNWR. Study highlights included recapture of a female that had lost her radio within 10 days of her capture in May 2004, and the first potential Harlequin Duck nest site found on Kodiak Island. Although no eggs or egg-shell fragments were found in the nest, DNA comparison of nest down and blood taken from the female during radio placement will be used to confirm whether the nest's occupant was the radio-tagged hen. Zwiefelhofer also conducted the annual Harlequin Duck molting survey on approximately 600 km of shoreline

in the bays of western KNWR. Numbers of molting harlequins were up slightly from the 2005 results, with 2 of the 3 bay survey sites remaining stable since 1994. However, Harlequin Duck numbers in Uyak bay have dropped approximately 60% since 1994, and they continue to be depressed despite a slight 2006 increase. Excessive hunting pressure seems to be the most likely cause of this reduction, based on hunter band returns.

Black Oystercatchers and Pigeon Guillemot numbers on the KNWR coast were also up from 2005, with a record 48 juvenile Pigeon Guillemots recorded during the survey. Capture efforts by KNWR personnel during the 2006 summer field season resulted in the banding of 142 Harlequin Ducks, 67 Common Mergansers (*Mergus merganser*), and 75 Barrow's Goldeneye (*Bucephala islandica*). Over 190 avian influenza samples were collected in cooperation with the UAF testing program as part of this work. On August 6, the first ever Kittlitz's Murrelet (*Brachyramphus brevirostris*) nest was discovered in the Kodiak NWR by Stacy Studebaker, one of three botanists surveying the Mount Glottof Research Natural Area (RNA) as part of a month-long botanical inventory project funded by the USFWS.

In 2006, the seabird component of the Apex Predator Prey project based at UAF, which has collected data on three seabird species in Chiniak Bay, Kodiak Island for 5 field seasons, entered the writing and wrapup stage. The research on Black-legged Kittiwake, Glaucous-winged Gull, and Tufted Puffin is integrated with synoptic investigations of the abundance and distribution of forage fishes (**Robert Foy**, UAF) and the diets and habitat use of marine mammals (**Kate Wynne**, UAF), within the umbrella of the GAP project. GAP seabird coordinators **Loren Buck** (University of Alaska Anchorage) and **Dean Kildaw** (UAF) provided guidance and support to the suite of graduate student projects under Apex. **Katie Murra** is doing research for her master's on colony attendance and reproductive ecology of Black-legged Kittiwakes; **Brook Gamble** is investigat-

ing stress hormones and breeding biology of Glaucous-winged Gulls for her master's; **Cory Williams** is wrapping up lab work for his PhD, using stable isotopes, fatty acid analysis, and stress hormones to investigate diets, foraging ecology, and nestling growth and development in Tufted Puffins; **John Brewer** is doing his master's on relationships between stress hormones in nestling kittiwakes and brood size, chick status, investigator disturbance, and colony productivity. Postdoctoral fellows **Andre Breton** and **Karel Allard** are using radiotelemetry data from kittiwakes to address questions regarding colony attendance and the at-sea distribution of foraging individuals. In addition to assisting in the lab and field, **Erin Whidden** is investigating effects of radio transmitters on Tufted Puffins, and **Robert Fridinger** is looking at effects of handling sequence on stress hormones in kittiwake broods of two. Undergraduate assistant **Pierre Thompson** analyzed seabird diet samples from 2005 and contributed to management of our database. **Nora Rojek**, **Chelsea Effinger** and **Rich Macintosh** volunteered on the annual kittiwake census in Chiniak Bay this August. Collaborators **Katie O'Reilly** (University of Portland) and **Sara Iverson** (Dalhousie University) contributed expertise in the areas of stress hormones and fatty acid analyses, respectively.

PRINCE WILLIAM SOUND

Bob Day and **Steve Murphy** of ABR, **Keith Parker** of the Data Analysis Group, and **John Wiens** of the Nature Conservancy continued research on impacts of the *Exxon Valdez* oil spill on seabirds in Prince William Sound.

Scott Hatch (USGS) continued research and monitoring of seabirds on Middleton Island, including continuation of the protocol for supplemental feeding of Black-legged Kittiwakes in the radar-tower colony. The Middleton camp leader this year was **Tim van Nus**, who was assisted by **Anne Voorbergen** and **Monica Parsons**. Two graduate students from Toulouse, France, **Joel White** and **Hervé Mulard**, continued

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their research on behavioral ecology of kittiwakes, assisted by **Michelle Du Toit** and **Cristophe Gouraud**. **Jana Kotzerka** (University of Kiel) joined the crew this summer to undertake some highly successful deployments of data loggers on Pelagic Cormorants (*Phalacrocorax pelagicus*) at the tower. **Andy Ramey** (USGS) facilitated all aspects of the work on Middleton. Andy continued laboratory work on the genetics of Northern Fulmars (*Fulmarus glacialis*), developing micro-satellite markers and mtDNA sequences for populations sampled in the North Pacific and North Atlantic. Beginning 3 September 2006, Ramey has a new job with the USGS Alaska Science Center, working on the population genetics of Arctic cisco (*Coregonus autumnalis*) in northern Alaska.

SOUTHEAST ALASKA

Leslie Slater coordinated annual seabird monitoring at St. Lazaria Island. Slater and **Lisa South**, **Kim Morris**, **Emily Tompkins**, **Josh Swecker** and **Stacy Carlson** (AMNWR) monitored the timing of nesting events, reproductive success, prey and populations of Leach's and Fork-tailed Storm-Petrels, Pelagic Cormorants, Glaucous-winged Gulls, Pigeon Guillemots, Common and Thick-billed Murres, and Rhinoceros Auklets.

Michelle Kissling (USFWS) along with **Mason Reid**, **Scott Gende** (NPS), and **Paul Lukacs** (Colorado Division of Wildlife) conducted a study to assess the feasibility of using radiotelemetry to study Kittlitz's Murrelets in Icy Bay. They captured and radio-tagged 14 Kittlitz's Murrelets in the bay during 21–28 May, and conducted aerial surveys to relocate radio-tagged birds at least twice per week during 21 May–29 July. Michelle and her team also conducted two ground-based surveys for radiotagged birds during June and July. These were their first successful captures of the species in Icy Bay. Radiotelemetry efforts will be continued during the 2007 and 2008 breeding seasons.

Scott Newman (Wildlife Trust and FAO) and **Kim Nelson** (Wildlife Trust

and OSU) continued their 3-year study with **Darrell Whitworth**, **Harry Carter**, and **Matt Kirchhoff** to study the health, activity patterns, foraging ranges and habitat use of Marbled Murrelets in the Port Snettisham area of Southeast Alaska. During 2006 they focused on breeding behavior and identification of nesting habitat. Forty adult murrelets were radio-marked and were tracked using aerial flights, boat surveys, and data loggers. Two ground nests were located in Port Snettisham. Field support was provided by **Gwen Baluss**, **Blake Barbaree**, **Neil Barton**, **Jay Beedle**, **Meg Duhr-Schultz**, **Frank Keim**, **Michelle Kissling**, **Julie Koehler**, **Josh Koepke**, **Steve Lewis**, **Kate Savage**, **Iain Stenhouse**, and **Gus Van Vliet**. This project is funded by the Alaska Department of Fish and Game.

Falk Huettmann's EWHALE lab conducted winter transects for the third year off Yakutat (hosted by **Susan Oehlers**, U.S. Forest Service) and off Tofino, Canada. The focus was on coastal biodiversity, particularly of *Brachyramphus* murrelets.

ALBATROSS STUDIES

Rob Suryan (OSU) continued his satellite telemetry studies of North Pacific albatrosses. Highlights this year included the first efforts to track Short-tailed Albatrosses during the chick-rearing period. The project was a huge success, thanks to cautious planning and efforts of the field team on Torishima in February 2006, lead by **Fumio Sato** and **Noboru Nakamura** (Yamashina Institute for Ornithology), **Paul Sievert** (University of Massachusetts, USGS), and **Greg Balogh** (USFWS). All eight radiotagged birds were tracked during most of their chick-rearing trips, and in addition for part of the post-breeding dispersal. Results of this work have already caught the attention of the Japan Ministry of Environment and Ministry of Fisheries, and they will repeat the study in 2007. The Short-tailed Albatross telemetry project is a joint effort with funding from the Japan Ministry of Environment and USFWS, and in collaboration with the Yamashina Institute for Ornithology (facilitated by

Kiyoaki Ozaki).

Karen Fischer continued work with Suryan on a satellite tracking study of North Pacific albatrosses during the non-breeding season. She is working on her MS under **Dan Roby** (OSU). In July 2006 aboard the F/V *Kema*, Fischer, Suryan, the relentless chummer Roby, and skilled albatross capturer **Greg Balogh** (USFWS) deployed satellite transmitters on six Short-tailed (*Phoebastria albatrus*), 10 Black-footed (*P. nigripes*), and 10 Laysan Albatrosses (*P. immutabilis*). Capture efforts during the 17-day cruise were concentrated near Seguam and Amlia Islands in the central Aleutian chain. Data will be used to evaluate the albatrosses' marine habitat use and spatial and temporal overlap with commercial fisheries, in comparison with data from albatrosses captured in 2003 and 2005. Tracks of some of these birds are posted on the Albatross Project website (www.wfu.edu/albatross/), in collaboration with **Dave Anderson** (Wake Forest University). Blood and feather samples were collected for population genetics and stable isotope analysis. Portions of this work are being integrated with related studies off California under **Michelle Hester** (Oikonos), **David Hyrenbach** (UW), and **Cheryl Baduini** (The Claremont Colleges), and those off Hawaii and Mexico run by **Scott Shaffer**, **Bill Henry**, **Yann Tremblay** (Tracking of Pacific Pelagics, University of California at Santa Cruz) and **Lindsay Young** (University of Hawaii).

Some of Suryan's additional efforts this past year included integrating Short-tailed Albatross tracking and fishing effort data from the Alaska Groundfish Observer Program, in collaboration with **Ed Melvin** and **Kim Dietrich** (Washington Sea Grant, UW).

STATEWIDE AND OTHER PROJECTS

Dave Roseneau (AMNWR) coordinated collection of seabird eggs for the contaminants program of the long-term Seabird Tissue Archival and Monitoring Project (STAMP). Eggs were obtained from murres and gulls at more than 20 sites scattered throughout the refuge.

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Ed Melvin and **Michelle Wainstein** (Washington Sea Grant) presented final results of two studies (seabird distribution in relation to longline fishing grounds and seabird avoidance measures for small vessels) to the North Pacific Fishery Management Council so that the NPFMC could re-evaluate seabird mitigation requirements for longline vessels fishing in Alaskan state waters. Melvin, Wainstein, and **Kim Dietrich** (Washington Sea Grant) continued work with UW Applied Physics Lab to design a towed device to assist with better tracking of streamer lines. They also measured breaking strength of new and used integrated weight (IW) longline as part of their ongoing analysis of IW gear as a seabird mitigation supplement. IW results should be ready for submission by the end of the year. Melvin also received a "Stewardship and Sustainability Award" from the National Oceanic and Atmospheric Administration for his ongoing research on seabird bycatch in Alaska and internationally.

Kathy Kuletz and **David Irons** (USFWS) initiated a project that is putting seabird observers on ships of opportunity in Alaska waters. Between May and September of 2006, over a thousand km of transects were conducted during 12 cruises, from the Bering Strait to the Aleutian Islands, and northern Gulf of Alaska. The National Oceanic and Atmospheric Administration (NOAA) is providing space on their research vessels in Alaska. The seabird data will be integrated into the North Pacific Pelagic Seabird Database, and will eventually be analyzed in conjunction with the associated oceanographic and fisheries data. Although most cruises were onboard NOAA vessels, others were conducted as part of the Shelf-Basin Interaction Project headed by **Jackie Grebmeier**, GLOBEC studies headed in 2006 by **Russ Hopcroft** (UAF), vessel M/V *Tigllax* during refuge activities. The surveys were funded for May 2006 through April 2008 by USFWS and a grant from the North Pacific Research Board. At-sea observers included **Matt Brooks**, **Troy Guy**, **Liz Labunski**, **Tamara Mills**, **Martin Renner**,

Suzanne Romain, **Paul Suchanek**, and **Tom Van Pelt**. The project's objectives include updating and standardizing the at-sea protocols used in Alaska.

Bob Day, **Betty Anderson**, and **Lauren Attanas** (ABR) and **Richard Greer** of Golder Associates are completing a literature review of the effects of ambient lighting on marine fauna in the Arctic, including effects on marine birds. This work is funded by the U.S. Minerals Management Service.

Falk Heutmann's EWHALE lab (UAF) has several student papers coming forward on coastal and Alaskan GIS modeling issues. Projects included Marbled and Kittlitz's Murrelets, Short-tailed Albatross, coastal biodiversity in estuaries of the entire North Pacific Rim, and pelagic DMS (dimethylsulfide)-seabird and plankton relationships. Collaborators included the Geophysical Institute (UAF) and other partners. Public data were obtained from OBIS (Ocean Biogeographic Information System, <http://iobis.org/>), ArcOD (Arctic Ocean Diversity, <http://www.sfos.uaf.edu/research/arcdiv/index.html>), the USGS North Pacific Pelagic Seabird Database (<http://www.absc.usgs.gov/research/NPPSD/index.htm>), the Beringian Seabird Colony Catalog (USFWS), and other sources.

Martin Renner has started postdoctoral research at UW under **George Hunt** and **Julia Parrish**, in collaboration with the AMNWR and John Piatt, working on SMMOCI data collected over the years. He is looking at the relationship between the distributions of hydroacoustic biomass and pelagic seabirds, comparing 11 sites throughout Alaska.

Rob Suryan (OSU) has successfully defended his PhD thesis. He will continue working out of Oregon State University's Hatfield Marine Science Center in Newport, Oregon, with plans to continue current projects while also developing local studies. **Mike Shultz** finished his Master's in biology at University of Alaska Fairbanks in the fall under **Sasha Kitaysky** (Institute of Arctic Biology, UAF). His thesis is titled "Food, reproductive investment, and stress physiology of seabirds."

Tom Van Pelt has started a consultancy, Transboundary Ecologic LLC, focused on building solutions to marine conservation issues.

RUSSIA

Compiled by **Shiway Wang**

The Commander Islands of Russia border the Bering Sea west of the Aleutian Islands. They are of great interest because of their immense wildlife resources, including apparently stable populations of sea otters (*Enhydra lutris*) and Steller's sea lions (*Eumetopias jubatus*), which have declined dramatically in Alaska. They also have significant seabird concentrations, including one of only four significant colonies of the Red-legged Kittiwake (*Rissa brevirostris*) (all others are in Alaska). They are protected by the Russian government as the Commander Islands Nature Reserve (CINR).

Through a trip sponsored by the World Wildlife Fund, **Art Sows** of Alaska Maritime National Wildlife Refuge (AMNWR), **Tom Van Pelt** (Transboundary Ecologic LLC), and **Olga Romanenko** visited Petropavlovsk-Kamchatskii and the Bering Islands in July 2006. In meetings with CINR Director **Nikolay Pavlov** and Chief Biologist **Sergei Zagrebel'ny**, they discussed invasive species, seabird monitoring, seabird egg contaminants, response to oil spills, and outreach efforts. They also considered a "sister refuge" relationship between AMNWR and CINR. Cooperative field work on seabirds was initiated. Murre eggs were collected for contaminant sampling and archiving under the Seabird Tissue Archival and Monitoring Project (STAMP) program. A beach near the village of Nikol'skoe was chosen and set up for beached bird monitoring, which will become part of the COASST program; **Natasha Fomina** will lead this effort. Preliminary plans were developed for adding the CINR to a broad geographic database of seabird colony monitoring, through partnership between AMNWR and CINR. Loca-

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tions were evaluated for monitoring of seabird productivity, food habits, and populations, and planning began on joint training and implementation. Presentations were made in Petropavlovsk and on Bering Island on responses to oil spills and rodent invasions following shipwrecks. The Americans also delivered a Russian-language version of posters and a video about invasive rodents. Possibilities were discussed for CINR outreach to ships about the importance of being rodents-free when they enter the Zonal Management. High hopes exist for expanding our cooperation in the investigation, understanding, and protection of the Bering Sea ecosystem.

Falk Huettmann's EWHALE Lab (University of Alaska Fairbanks) carried out field work during late summer 2006 at six sites in Russian Far East (Khabarovsk region, Vladivostok region, Sakhalin Island, Kurile Islands, and two on Kamchatka) and at one site in Japan. Much of the ground work was done in collaboration with local contractor teams. Data on avian influenza, coastal waterbirds, seabird colonies, sea mammals, and beach pollution were collected along North Pacific flyways of seabirds and other birds. Field work at the Verengy River on Sakhalin Island deserves specific mention. This area was formerly in the Vostochnya Zakaznik national reserve. The area is one of the most pristine watersheds in the Sea of Okhotsk and has received international attention. Its coastal food chain is entirely virgin, extending from plankton and salmon (*Oncorhynchus* spp.) to top predators. Colonial seabirds include Black-legged Kittiwake (*Rissa tridactyla*), Slaty-backed Gulls (*Larus schistisagus*), Common Tern (*Sterna hirundo*), Spectacled Guillemot (*Cephus carbo*), Tufted Puffin (*Fratercula cirrhata*), Common Murre (*Uria aalge*), and Pelagic Cormorant (*Phalacrocorax pelagicus*). Steller's Sea Eagle (*Haliaeetus pelagicus*) seem to nest there, too. Mammals include brown bears (*Ursos arctos*), seals (mostly *Phoca largha*), Steller's sea lions (*Eumetopias jubatus*), and minke and killer whales (*Balenoptera acutorostrata* and *Orcinus*

orca). Due to strong resource demands, conservation management (including efforts to reduce poaching) currently depends on the regional government and nongovernmental organizations.

Huettmann also completed manuscripts on eight field seasons studying gulls, migratory waterbirds, and conservation management issues on the coast of the Sea of Okhotsk, Russian Far East.

Steve Johnson of LGL Ltd. (Sidney, British Columbia) writes that his firm, in association with LGL Sakhalin, was involved in three marine mammal projects in the Sea of Okhotsk, Russia this past summer, during which they opportunistically recorded marine bird observations.

CANADA

Compiled by **Ken Morgan**

WESTERN CANADA COLONY STUDIES

The Centre for Wildlife Ecology (CWE) at Simon Fraser University (SFU) marked its 13th year of operating the seabird research and monitoring program on Triangle Island in summer 2006. **Mark Hipfner** (CWE), and the Canadian Wildlife Service (CWS) in Delta, British Columbia (BC) led the program. They monitored breeding chronology, success, and related demographic parameters of Cassin's Auklets (*Ptychoramphus aleuticus*), Rhinoceros Auklets (*Cerorhinca monocerata*), Tufted Puffins (*Fratercula cirrhata*), Common Murres (*Uria aalge*), Pelagic Cormorants (*Phalacrocorax pelagicus*), Black Oystercatchers (*Haematopus bachmani*), and Glaucous-winged Gulls (*Larus glaucescens*). Breeding success for most species was close to normal for Triangle, although Tufted Puffins had a higher-than-average year, and Black Oystercatchers had a below-average year. The 2006 field crew consisted of **Rachel Darvill, Carla Gmeinhardt, Kristen Gorman, Jennifer Greenwood, Camilla Marcos, William Nelson, Christine Rock, and Joanna**

Smith (all on contract with SFU), **Valerie Labrecque** (on contract with SFU and CWS), and **Kyle Morrison** (MSc student at SFU).

CWS put considerable effort into seabird research and monitoring in various parts of BC in 2006. Hipfner, **Moira Lemon** (CWS, Delta) and **Keith Hobson** (CWS, Saskatoon, Saskatchewan), Labrecque, **Kristin Charleton** and **Glen Keddle** (contract with CWS), took part in population surveys and tissue sampling at the Rhinoceros Auklet colonies at S'Gaang Gwaii (QCI), Lucy Island, Pine Island and Seabird Rocks, as well as at Triangle. Hipfner and Keddle also visited Sartine, Lanz and Cox Islands (in the Scott Island chain) to assess direct and indirect effects that introduced mammals (rabbits, mink, raccoons) may be having on seabird populations.

Tony Gaston (CWS, Ottawa, Ontario), along with **Sophia Colantonio** and **Melanie Farquhar** (University of Ottawa,) and **Siobhan McPherson** (McGill University, Montreal) visited Reef Island in the Haida Gwaii/Queen Charlotte Islands (QCI) during May and June 2006. They examined improved methods of monitoring Ancient Murrelet (*Synthliboramphus antiquus*) populations using standardized call recordings and studied murrelet predation by Common Ravens (*Corvus corax*). The population of murrelets on Reef Island continues to increase; of 80 nest boxes deployed in 1997, 75% are now occupied.

However, Ancient Murrelet the population of nearby East Limestone Island in the QCI, where regular annual monitoring is conducted by the Laskeek Bay Conservation Society (LBCS), has shown a gradual decline since 1999, and nest boxes deployed there have not been occupied. In contrast, populations of both Cassin's Auklets and Fork-tailed Storm-Petrels (*Oceanodroma furcata*) on ELI, although small, seem to be increasing. **Jen Rock** and **Laura Cowen** led the LBCS's continued monitoring of Black Oystercatcher and Glaucous-winged Gull populations on the east side of Moresby Island (QCI). This was the 3rd year of a Black Oystercatcher inventory in Juan

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Perez Sound for the Gwaii Haanas National Park Reserve and Haida Heritage Site. Numbers of oystercatchers and gulls appear to be stable in Laskeek Bay and Juan Perez Sound. However, Glaucous-winged Gulls have decreased significantly in Masset Inlet (QCI), where they were censused by Gaston in June.

Harry Carter (Carter Biological Consulting, Victoria, BC) and **Percy Hébert** (Thompson Rivers University, Kamloops, BC) conducted a survey of Pelagic Cormorant (*Phalacrocorax pelagicus*) colonies in Barkley Sound, BC, including the Broken Group portion of Pacific Rim National Park Reserve. Barkley Sound was largely empty of Pelagic Cormorants (only 2 active colonies), compared with higher numbers in the 1970s and early 1980s. The decline may possibly be due to prey changes and human disturbance.

Anne Harfenist (Harfenist Environmental Consulting, Smithers, BC) began a multi-year study of Leach's Storm-Petrel (*Oceanodroma leucorhoa*) adult survival at two sites along the BC coast: one off eastern Moresby I. in Haida Gwaii/Queen Charlotte Islands, and one off the west coast of Vancouver Island.

Heather Major (CWE) is working on her PhD at SFU with **Ron Ydenberg** (SFU) and **Mark Hipfner**. Heather completed her first field season on Langara Island (BC), with assistance from **Elin Price** and **Jacques Marais** (under contract with CWS) in June, studying the recovery of Ancient Murrelets (*Synthliboramphus antiquus*) following the eradication of rats in the 1990s.

In 2006, Bighorn Wildlife Technologies Ltd (BWTL) initiated a collaborative study to examine the factors affecting distribution of a local breeding population of Harlequin Ducks (*Histrionicus histrionicus*) on the eastern slope of Alberta. The purpose is to determine the importance of small-scale habitat features, prey availability, and human activity to a local breeding population of Harlequin Ducks. Results will be used to develop a predictive habitat model for Harlequin Ducks in east slope streams of Alberta's northern foothills, based on

characteristics of the study stream. **Beth MacCallum** (BWTL, Hinton, Alberta) writes that the report, *The Harlequin Duck in Alberta's Northern Rocky Mountains and Foothills: A review of breeding ecology and conservation outlook*, is now available from the Foothills Model Forest website (<http://www.fmf.ca/publications.html>). Study partners are the Alberta Conservation Association, Weyerhaeuser Company Ltd., Alberta Parks and Protected Areas, Elk Valley Coal Corporation, Whitehorse Wildland Park, and the University of Calgary.

MARBLED MURRELETS

Doug Bertram (Canadian Wildlife Service, Sidney, BC) is involved in a long-term program to estimate the status and trend of Marbled Murrelets (*Brachyramphus marmoratus*) populations. Bertram and others are using marine radar to monitor populations at selected locations within each of six conservation regions of BC over a ten-year period. In 2006, the Central Coast and South Coast Conservation regions of BC were surveyed by **Bernard Schroeder** (Bernard K Schroeder Consulting, Nanaimo). Radar equipment was loaned to TimberWest Ltd. to survey the East coast of Vancouver Island. **Caeley Thacker** and **Lana Cortese** did the fieldwork under the supervision of **Dave Lindsay** (all of TimberWest). CWS supported a resurvey of Clayoquot Sound by **Alan Burger**, and his field crew ten years after the initial surveys.

Bertram is working with **Kristin Charleton** (under contract with CWS) and the Department of Fisheries and Oceans on a study of bycatch of Marbled Murrelet in gillnet fisheries in BC. Charleton retrieved birds from fishers during commercial salmon openings this summer. Bertram and Charleton are comparing numbers of birds reported by fishers in general and by observers on vessels. Bertram is also involved with work on trophic levels of Marbled Murrelets using stable isotopes, in collaboration with **Peter Arcese** of the University of British Columbia (UBC), Vancouver, and **Ryan Norris** (Guelph University, Guelph, Ontario). In the summer of 2006 Marbled

Murrelets were captured in Desolation Sound and feathers were sampled.

Louise Blight of the Parks Canada Agency (PCA) and Procellaria Research and Consulting, Victoria participated in marine surveys of Marbled Murrelets and other marine bird species in Barkley Sound. The surveys are part of a multi-year field study being carried out by **Pippa Shepherd** and **Cliff Robinson** of PCA (Vancouver, BC) in order to develop a marine foraging habitat model. The model will also incorporate long-term transect data from local surveys conducted by **Bob Hansen**, **Danielle Bellefleur** (PCA, Pacific Rim National Park Reserve) and other PCA staff, and will eventually be used as a tool to help manage murrelet foraging habitat in Pacific Rim National Park Reserve.

Alan Burger is continuing research on Marbled Murrelets on Vancouver Island and elsewhere. In 2006, Burger and his team (**Jenna Cragg**, **Marina Milligan**, **Derek Shaw**, and **Bonnie Vogt**; all on contract with UVIC) repeated radar surveys of murrelets in 14 watersheds in Clayoquot Sound that were surveyed in 1996–1998. The results should indicate whether any changes in regional or watershed populations have occurred over the past decade. Burger is conducting low-level helicopter surveys of murrelet nesting habitat in Haida Gwaii/Queen Charlotte Islands, aimed at testing the reliability of habitat algorithms and air photo interpretation. His collaborators on these surveys are **Louise Waterhouse** of the BC Ministry of Forests, Nanaimo, and **Alvin Cober** of the BC Ministry of Environment (MOE), Queen Charlotte City, BC. Burger is also working with **Rick Page** (on contract with UVIC), **Trudy Chatwin** (MOE, Nanaimo) and **Doug Bertram** to develop reliable habitat maps for Vancouver Island and elsewhere in BC, and the application of these maps for long-term management of murrelets.

In 2006, **John M. Cooper** and others conducted radar surveys from May to September for Marbled Murrelet flight activity over a proposed wind farm on

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the north coast of BC. The data will be used in a risk assessment for murrelets and other birds associated with the wind farm.

Rob Ronconi (UVIC) is continuing his PhD with **Alan Burger** and has now completed his fieldwork on marine habitat use by Marbled Murrelets off southwestern Vancouver Island. Ronconi's research focuses on fine-scaled mapping of foraging murrelets and testing associations with a range of physical and biological parameters. During this third and final field season, new work included substrate mapping and snorkeling surveys of beaches to find sand lance (*Ammodytes hexapterus*). He was assisted by **Nicki Watson**, and **Trevor Haynes** (both contract with UVIC) has been helping Ronconi with sand lance distribution and habitat use.

Mike Silvergieter is working on his MSc with **Dov Lank** at CWE, studying nest predation on Marbled Murrelets. Silvergieter's research involved artificial nests with motion-triggered camera systems positioned at 64 sites on the southern Mainland Coast of BC and on southwestern Vancouver Island. His project is a continuation of work initiated by **Josh Malt** (SFU) investigating edge effects on nest predation along industrial (clear-cut) and natural edges.

PELAGIC

Ken Morgan continues with two projects examining the community relationships and at-sea distribution of seabirds in comparison with oceanographic features. His collaborators are **Bill Syde-man** and others at PRBO Conservation Science, **Sonia Batten** of the Sir Alister Hardy Foundation for Ocean Science (SAHFOS), and **David Hyrenbach** of the University of Washington (UW), Seattle, and the Duke University Marine Lab. The projects focus on the 1500 km Line P transect and the Continuous Plankton Recorder (CPR) survey between Vancouver and Japan. **Mike Bentley** (Victoria) conducted two Line P surveys, and **Mike Henry** (Montreal, QC) conducted 3 CPR trips. Morgan is also collaborating with Hyrenbach and **Peter Hodum** (Oikonos

Ecosystem Knowledge and UW) on a project supported by the Commission for Environmental Cooperation and the U.S. National Oceanographic and Atmospheric Administration to track Pink-footed Shearwaters (*Puffinus creatopus*) from their Chilean colonies into North American waters.

Sean Boyd (CWS, Delta) is working on a joint project with **Mark Hipfner** (CWS, Delta) and **Ken Morgan** tracking the post-breeding movements of Common Murres (*Uria aalge*). In late July, 10 murres were captured on Triangle Island (BC) and satellite tags were implanted by veterinarian **Malcolm McAdie** (Nanaimo). The project is supported by the Birds Oiled At Sea program of Environment Canada.

Since Sept. 2005, **Laura McFarlane Tranquilla** and others have written a report that summarized the of three years results (1999–2001) of radio telemetry on Cassin's Auklets, and one year (2002) on Rhinoceros Auklets nesting on Triangle Island (McFarlane Tranquilla, L., et al. 2005; CWS Technical Report Series No. 423). Tranquilla notes that in the last year of the study, 76% of tagged Cassin's Auklets were detected an average of 60 km northwest of Triangle. That location was substantially different from what was observed in 1999 and 2000, when Cassin's were located 30–60 km to the southwest of Triangle. In all years, the birds were distributed over the shelfbreak. In the one (and only) year of tracking Rhinoceros Auklets they detected 43% of the tagged birds, at an average distance of 60 km to the northwest of the island.

Jamie Kenyon (CWS, Delta), has been leading a project on the "Marine Bird Areas of Interest in British Columbia's Marine Environment." Using many datasets, Kenyon, **Michael Dunn** (CWS, Delta) and Moore identified areas of interest to marine birds within the Exclusive Economic Zone of Canada's Pacific coast. Kenyon has also been working on new pelagic seabird atlas with **Ken Morgan** (CWS, Sidney), Moore and **Laura MacFarlane Tranquilla** (contract with CWS, Delta). This project updates the 1991 "Atlas of Pelagic Birds of Western

Canada" by Morgan et al., and includes data from 1982 through 2005. Distributions of 46 seabird species are described for waters off Canada's west coast out to 147° W. Data were collected from 1982 to 2005 aboard ships of opportunity.

MORTALITY STUDIES AND OIL SPILLS

In early January 2006, **Ken Morgan** (CWS Sidney), **Doug Bertram** (CWS, Sidney) and **Mark Hipfner** (CWS, Delta) began receiving reports from the Queen Charlotte Islands (QCI) of unusual numbers of seabirds and seaducks either dead on or adjacent to beaches or offshore. Other birds were lethargic and unresponsive to the approach of humans or boats. Species included Cassin's Auklets, as well as unconfirmed reports of other Northern Fulmar (*Fulmarus glacialis*), Fork-tailed Storm-Petrel, Rhinoceros Auklet, Marbled Murrelet, Ancient Murrelet (*Synthliboramphus antiquus*), grebes and seaducks. Over a 3–4 week span in late December 2005 and early January 2006, a series of severe storms traversed the area, which may have been the cause of the reported high numbers of beach-cast birds. With the cooperation of many individuals and agencies, but especially with great assistance from veterinarian **Elena Garde** (MOE, Victoria) and biologist **Alvin Colber** (MOE, Queen Charlotte City), 24 bird and 4 fish carcasses were collected and forwarded to MOE's Provincial Animal Health Center (Abbotsford, BC) for diagnostic evaluation.

Some of the specimens had undergone extensive autolytic change, freezing, and postmortem scavenging (loss of multiple internal viscera). Only selected diagnostic analyses were undertaken for these birds—trace mineral analysis of liver, brain cholinesterase, and real-time polymerase chain reactions for avian influenza (AI) and Newcastle disease virus. Additional studies were undertaken in fresher and non-scavenged specimens. Some birds were in relatively good condition, based on body fat, while others were in very poor condition with pronounced loss of pectoral musculature and very prominent keels. Because of the number

of reports of birds presenting similar clinical signs and gross pathology over a relatively short time, infectious processes and toxic algae were the initial considerations. Polymerase chain reaction of pooled tissues or oropharyngeal and cloacal swabs were negative for Newcastle Disease virus and for avian influenza (including H5N1). No viruses were recovered by egg inoculation. Crop and gizzard contents and segments of small intestine were collected and forwarded to the Canadian Food and Inspection Agency lab (Dartmouth, Nova Scotia) and screened for domoic acid, paralytic shellfish poisoning, amnesic shellfish poisoning, and lipophilic and other recognized marine toxins. All results were negative. Based on nutritional status of the birds and the lack of material in the crops and gizzards of most, it was concluded that the prime cause of mortality was probably starvation.

Sabina Wilhelm (CWS, St. John's, NL) has been working on a followup to the Terra Nova oil spill that occurred in November 2004 on the Grand Banks. A CWS technical report assessing the impacts of this spill on seabirds is now available. It was estimated that between 10,000 and 16,000 alcids were put at risk by the spill. Petro-Canada was charged and made to pay a penalty of \$290,000, including \$120,000 towards the Environmental Damages Fund and \$100,000 towards the Environmental Science Merit Scholarship at Grenfell Colleges, which is a campus of MUN on the west coast of the province.

Pat O'Hara (CWS and UVIC, Sidney and Victoria) continued to work with **Ken Morgan** (CWS, Sidney) on the Birds Oiled At Sea project. O'Hara is assessing the impact of chronic oil releases on seabirds within Canada's west coast EEZ. He is developing models, to predict (spatially and temporally) the probability of birds encountering oil, as well as forecasting where they might reach land, and hindcasting where they might first have encountered oil. Inputs include shipping routes, ocean currents, winds, observed discharges, and known at-sea distributions of seabirds,

Peter Davidson (Bird Studies Canada, Delta) coordinates the BC Coastal Waterbird Survey, a citizen science venture. This is the only ongoing survey of its kind in the Pacific Northwest. Since its inception in the winter of 1999/2000, over 400 volunteer surveyors have dedicated the second Sunday of each month to conduct standardized high-tide bird counts at over 260 sites along the BC coastline. As of the summer 2006, seven winters of data collection with over 9100 surveys had generated over 100,000 data records. A recent technical evaluation of the first five years of the survey (1999–2004) examined the ability to detect annual population changes, mapped species distributions and abundances, and took a preliminary look at individual species abundance trends (Badzinski et al. 2006; CWS Technical Report Series No. 455, Delta, BC). The 5-year dataset was powerful enough to generate credible population-trend predictions (i.e. detect annual population changes of $\leq 3\%$ or less) for nine of the 58 most commonly recorded species. Analyses predict that credible population-trend data will be generated for many more (34) species by the winter of 2010/2011.

The BC Beached Bird Survey was reestablished in 2002 by BSC (with support from CWS), and Davidson recently summarized some of the results. From 2002 to 2005, 74 sites were surveyed by approximately 100 volunteers, with 40–60 sites monitored annually. From August 2002 to July 2005, 991 beached bird surveys were conducted at those 74 sites, covering approximately 2521 km. Four hundred and thirty-eight beached birds were found (49 identified species), 74% of which were encountered on the west coast of Vancouver Island and in Boundary Bay (BC). Preliminary comparisons with surveys from 1986–1997 suggest that there has been little change in the overall rate of deposition on the west Vancouver Island and Boundary Bay shores over the past decade.

OTHER WORK

Sean Boyd (CWS, Delta) organized two workshops on Western Grebes

(*Aechmophorus occidentalis*) in the fall of 2006 in Delta and in Edmonton, Alberta), with **Bev Gingras** (CWS, Edmonton) to address concerns of declining numbers. Also, as he has done since 1996, Boyd is coordinating a count of Eared Grebes (*Podiceps nigricollis*) on Mono Lake, California in October [see regional report for northern California].

Vasiliki Karpouzi has now completed her MSc at UBC. Her project entailed creating a database on the biology, foraging ecology and population dynamics of all of the world's seabirds. She not only compiled existing population data for 351 seabird species, by year and breeding locality (spanning 1950 to 2003); she also included information on diet, which was used to estimate species-specific trophic levels. Using these data, as well as known maximum distances flown in search of prey, Karpouzi mapped the at-sea distribution of seabirds and their food consumption on a spatial grid of half-degree cells. From this she generated global maps of seabirds-fisheries resource overlap, as a means of evaluating potential for competition for the same resources between these two counterparts, and to identify "hotspots" in the world where such competition may be of major concern. The seabird database has now been incorporated in SeaLifeBase (an initiative of the Sea Around Us Project, funded by the Oak Foundation), a global electronic database that compiles biological information for all marine organisms in the world. It will be launched in late 2006 through AquaSpecies (www.aquaspecies.org) and will eventually make all aquatic species databases searchable.

Karpouzi is now working on her PhD in the Department of Resource Management and Environmental Studies and the Fisheries Centre at UBC. She notes that the mapping of the at-sea distribution of seabirds revealed certain drawbacks when using only biological parameters to depict the foraging distributions of seabirds. In order to resolve some of the problems, her first exercise will be the development of predictive species- or family-specific models for the global

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distribution of seabirds, using environmental and oceanographic parameters (from the literature) that are suspected to influence the "choice" of marine habitats by seabirds.

Estuaries of western Canada are being identified, mapped, and ranked; the product is intended for use as a regional-scale land-use planning tool. **Jamie Kenyon** (CWS, Delta), along with **Dan Buffett** (Ducks Unlimited Canada, Surrey, BC), **Kathleen Moore** (CWS, Delta), and **John Ryder** (Yukon Land Use Planning Council, Whitehorse, Yukon) participated in the work, using criteria of the Pacific Estuary Conservation Program.

Spencer Sealy of the University of Manitoba, Winnipeg, and **Harry Carter** (Victoria) continue to plug along on work initiated more than 25 years ago (!) that involves analyses of vagrancy in auks (see details in Regional Reports, Pacific Seabirds 29(2):109, 2002). Since 1999, several short papers have been published. Two detailed analyses are being completed, on vagrancy of auklets (*Aethia* spp.) and on the relationship between inland vagrancy and wrecks of Dovekies (*Alle alle*). Interpretations of the analyses are being couched in terms of the species' natural history, oceanic features, and climate.

Jo Smith of UW and Birdsmith Ecological Research, Victoria, and **Ken Morgan** worked on developing a draft recovery strategy for the Pink-footed Shearwater (*Puffinus creatopus*) and Short-tailed Albatross (*Phoebastria albatrus*) in Canada. Both are listed as threatened by the Committee on the Status of Endangered Wildlife in Canada. Smith's subcontractor was **Nadine Parker** (Vancouver). Smith and Morgan published their assessment of seabird bycatch in BC (CWS Technical Report Series No. 401, 2006). Smith and **Jake Fraser** (Fraser Research and Development, Pender Harbour, BC) worked with the U.S. Fish and Wildlife Service (Anchorage, Alaska) on a color seabird guide for fishery observers in Alaska [see Alaska regional report]. Smith continues her PhD with **Julia Parrish** (UW).

Louise Blight has been writing the Canadian status report for the Black-footed Albatross (*Phoebastria nigripes*), with coauthors **Jo Smith** (University of Washington [UW], Seattle, WA) and **John M. Cooper** (Manning, Cooper and Associates Ltd., Errington, BC). Blight is also working with another **John Cooper** (University of Cape Town, South Africa) to draft a web page account for the Agreement on the Conservation of Albatrosses and Petrels (ACAP), reporting on the status of seabird conservation efforts in Canada. In November and December, Blight will be working with **Ron Naveen** (Oceanites, Maryland, USA), monitoring the effects of tourist visits to penguin (*Pygoscelis* spp.) and other seabird colonies on the Antarctic Peninsula, and conducting inventories of newly-discovered populations there.

EASTERN CANADA

COLONY STUDIES

John Chardine of CWS, Sackville, New Brunswick (NB) continues to work on phalaropes and their food in the outer Bay of Fundy. In 2005, we observed Red-necked Phalaropes (*Phalaropus lobatus*) feeding in the waters around Deer Island, NB for the first time since they disappeared 20 years ago. This may be an indication that feeding conditions are improving, and if they are, Chardine will track that with his annual surface plankton tows. This year, Chardine launched a cooperative survey of phalaropes in the outer Bay of Fundy (with CWS, U.S. Geological Survey, U.S. Fish and Wildlife Service, Manomet Bird Observatory and Nova Scotia Department of Natural Resources). They are conducting biweekly simultaneous surveys off Brier Island, Nova Scotia, and around Deer Island, and on three of the boat surveys they will have an aircraft in the air. Chardine and **Greg Robertson** (CWS, St. John's and Labrador, NL) have developed a model that gives a good prediction of the breeding success of Black-legged Kittiwakes (*Rissa tridactyla*) at Witless Bay, NL. Parameters in the model are climate variables (sea surface temperature in May-June-July, the state of the North

Atlantic Oscillation, and rainfall in July), and it explains 72% of the variance.

Kyle Elliott and **Gail Davoren** of the University of Manitoba (UofM), and **Tony Gaston** (CWS, Ottawa) continued working on Thick-billed Murres (*Uria lomvia*) at Coats Island, Nunavut. In 2006, murre diet was particularly diverse, with an unusually high proportion of arctic shanny (*Stichaeus punctatus*) and, at least in comparison to recent years, of Arctic cod (*Boreogadus saida*). Sand lance (*Ammodytes* sp.) numbers were generally down compared to recent years, but they increased towards the end of the chick-rearing period. Elliott and others attached time-depth-temperature recorders on about 150 birds, of which 50 were simultaneously injected with doubly-labeled water. Following analyses this winter, we anticipate determining activity-specific (flight, diving, resting) metabolic rates for Coats Island murres. As these murres apparently feed themselves at the same trophic level as they feed their chicks, we also obtained C and N stable isotope plasma samples to determine whether birds that feed their chicks rare food items also feed themselves the same rare items.

Gail Fraser (York University, Toronto), **Greg Robertson** of CWS, St. John's, and **Janet Russell** (The Alder Institute) continued monitoring the population of Manx Shearwaters (*Puffinus puffinus*) and Leach's Storm Petrels on Middlelawn Island, NL. Their project includes mark-recapture efforts for both species, and searches for Manx Shearwater nests; this year they found 13 Manx Shearwater eggs/chicks.

Jean-François Rail, **Pierre Brousseau**, **Richard Cotter** and **Sébastien Paradis** (all of CWS, Québec), helped by **Myriam Lambany** (Collège d'enseignement général et professionnel de La Pocatière, Québec) surveyed seabird colonies of the estuary of the St. Lawrence River. Results are not analyzed yet, but seabird populations appear relatively stable in this area. Rail, helped by volunteer **Claude Nadeau**, continued his collaboration in the field with **Dave Field** and **Bill Montevecchi** of Memorial

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University of Newfoundland (MUN), St. John's. Fifield's MSc project includes the use of light-based geolocation loggers on Northern Gannets (*Sula bassana*) nesting at Bonaventure Island, Québec.

Raphaël Lavoie spent a second summer at Corossol Island, Québec, under contract with CWS. He monitored productivity, diet, and chick growth in Black-legged Kittiwakes and Razorbills (*Alca torda*), as well as the diets of Herring Gulls (*Larus argentatus*) and Double-crested Cormorants (*Phalacrocorax auritus*). This year's "highlight" was the rapid disappearance of most large kittiwake chicks near the end of the chick-rearing period, resulting in a catastrophic annual productivity. At the same time, kittiwake feathers and leg bands were found in gull regurgitations, whereas capelin (usually the staple food) vanished from the gulls' diet. It appears that the sudden unavailability of capelin late in the breeding season forced Herring and Great Black-backed Gulls (*Larus marinus*) to prey on anything they could find, including large kittiwake chicks. Assisted by **Andrew Waye** (University of Ottawa), Lavoie also started the fieldwork for his MSc with **David Lean** (University of Ottawa). He will look at the influence of diet and foraging ecology on mercury levels in seabirds at Corossol Island.

Greg Robertson (CWS, St. John's) reports that an emphasis was placed on surveying more Black-legged Kittiwake colonies around the Avalon Peninsula (NL) in 2006. In addition, intensive surveys of tern (*Sterna spp.*) colonies was conducted in northern portions of NL, and an increased banding effort for Common Murres (*Uria aalge*) continued in partnership with **Ian Jones** (MUN). In general, productivity of seabirds was high in NL in 2006.

A crew of six visited Coats Island, Nunavut, in July and August to continue studies of Thick-billed Murre (*Uria lomvia*) populations, diet and foraging behavior. Personnel included **Tony Gaston**, **Kyle Elliott**, **Paula Redmond** (University of Aberdeen, Aberdeen, UK), **Kate Ashbrook** (Newcastle University,

UK), **Mirjam Barrueto** (University of Zurich, Switzerland), and **Paul Woodard** (Trent University, Peterborough, Ontario). The colony continues to prosper. Two thousand murre nestlings, as well as 28 Glaucous Gulls (*Larus hyperboreus*), were banded.

Rob Ronconi (UVIC) has been collaborating with members of the Grand Manan Whale and Seabird Research Station (**Heather Koopman**, **Andrew Westgate** and **Sarah Wong**) to capture and sample Greater Shearwaters (*Puffinus gravis*) in the Bay of Fundy, NB. Blood and feather samples are being collected for dietary analyses (isotopes and fatty acids), and six satellite tags were deployed in August and September to track the local movements and migration of these birds.

WATERFOWL AND WINTERING BIRDS

Jean-Pierre Savard (CWS, Sainte-Foy, Quebec) writes that the Quebec region was very active in terms of seaduck research. Savard and Jean-François Giroux (University of Quebec in Montreal) banded approximately 1,000 Common Eiders (*Somateria mollissima*) in the St. Lawrence River estuary in an effort to generate survival estimates. Ten satellite transmitters were implanted in the eiders (three males and seven females). Another 15 eiders, breeding in the Gyrfalcon archipelago in Ungava Bay, northern Quebec, were implanted with satellite transmitters. Hélène Diéval has just completed an MSc thesis entitled "Factors influencing the distribution of Common Eiders during the brood rearing period in the St. Lawrence estuary," under Savard and Giroux. Savard and Magella Guillemette (University of Québec in Rimouski, QC) implanted data loggers in four female eiders to better document the annual cycle of eiders. This is the first year of a three-year project. Savard and Louis Lesage (CWS, Sainte-Foy) implanted three satellite tags in breeding Surf Scoters (*Melanitta perspicillata*) at Lake Malbaie (about 90 km north of Quebec City). Graduate student Shawn Kraig, along with Rodger Titman (McGill University, Montreal), has completed the

last year of a PhD project on the moulting ecology of Red-breasted Mergansers (*Mergus serrator*) at Anticosti Island. Marc O'Conner is completing his second year of an MSc on the moulting ecology of Surf Scoters along the Labrador coast, under Savard, Titman and Scott Gilliland (CWS, Sackville). Fifteen moulting Surf Scoters were implanted with satellite tags this year, in collaboration with Matt Perry and Gilliland. A goal of the project is to determine fall staging and wintering areas of the scoters.

Yves Aubry (CWS, Quebec) and Paradis conducted a survey of migrating shorebirds, with focus on the Red Knot (*Calidris canutus*) from July through to October in the Mingan Archipelago (Quebec), in collaboration with PCA.

Falk Huettman (University of Alaska Fairbanks) has completed and published four-year field study on wintering auks, focusing on Razorbills (*Alca torda*) in the Bay of Fundy, eastern Canada.

PELAGIC STUDIES

Carina Gjerdrum (CWS, Dartmouth, Nova Scotia) and **David Fifield** (CWS, St. John's) have initiated a pelagic monitoring program to map the at-sea relative abundance and distribution of marine birds in Atlantic Canada. A subset of the funding for this program comes from the Environmental Studies Research Fund (ESRF) and is directed towards monitoring areas intersecting hydrocarbon industry activities in Atlantic Canada waters. The program uses ships-of-opportunity that travel offshore along set routes that are repeated on a seasonal or annual basis; these include Canadian Coast Guard vessels conducting oceanographic studies, offshore supply vessels, ferries, and container ships involved with the Continuous Plankton Recorder CPR program of SAHFOS. They are using a line-transect distance sampling methodology incorporating the snapshot method for flying birds. A new database has been created to house all at-sea seabird data in Atlantic Canada, including data from this program as well as the former Programme Intégré des Recherches sur les Oiseaux Pélagiques (PIROP) pro-

gram and industry-collected stationary platform survey data. Both the survey methodology used and the structure of the database were developed in consultation members of the European Seabirds At Sea working group, ensuring that data are compatible and comparable across the Atlantic. Since March 2006, they have conducted over 85 days of surveys offshore of Nova Scotia and NL, as well as a number of inshore surveys.

MORTALITY AND POLLUTION STUDIES

Significant fisheries bycatch of Common Murres around major colonies was noted in 2006, according to **Greg Robertson** (CWS, St. John's) and **Ian Jones** (MUN). Bycatch reached levels not seen since the groundfish fishery moratorium in 1992.

Robertson reports that an oil spill response was the focus of most work in early 2006. An estimated minimum of 574 birds (of 19 species), both coastal and pelagic, were impacted. In the summer 2006 most effort was placed on sampling seabirds for AI, in partnership with veterinarian **Hugh Whitney** (Department of Natural Resources, St. John's), as part of the overall Canadian AI monitoring effort. Close to 1000 samples from 4 species were collected.

Jean-Pierre Savard and **Jean-François Giroux** sampled several hundred Common Eiders for avian cholera in the St. Lawrence River estuary. One hundred and fifty eiders from the Gyr-falcon archipelago were sampled for AI (none tested positive), and approximately 50 birds were sampled for avian cholera (to be analysed).

WASHINGTON AND OREGON

Compiled by **Don Lyons**

CASPIAN TERNS

Oregon State University (OSU), the U.S. Geological Service (USGS)-Oregon Cooperative Fish and Wildlife Research Unit, and their cooperators U.S. Geologi-

cal Survey-Oregon Cooperative Fish and Wildlife Research Unit, and their cooperators continued research on predation by seabirds on salmon smolts in the lower Columbia River. They monitored the size and productivity of the largest known breeding colony of Caspian Terns (*Sterna caspia*) on East Sand Island in the Columbia River estuary. This colony has been managed by a group of federal, state, and tribal resource management agencies. In addition, the size and productivity of the largest known colony of Double-crested Cormorants (*Phalacrocorax auritus*), also on East Sand Island, was monitored. A full report on this work is published in the "Reports" section in this issue of *Pacific Seabirds*.

OSU and its cooperators also continued to study a recently established colony of Caspian Terns on Dungeness Spit, in Dungeness National Wildlife Refuge on the Washington coast. The colony evidently formed during the 2003 nesting season, amongst driftwood on a sandy substrate. Approximately 795 breeding pairs nested there in 2006, which was a 17% increase since 2005 and a 202% increase compared with 2004. This is now the second largest Caspian Tern colony in the Pacific Northwest, after the one on East Sand Island in the Columbia River estuary. Approximately 200-300 fledglings were produced this year; nesting success was 0.25-0.38 young per nesting pair, lower than in the previous two years. In 2006 we observed nest predation by coyotes and a complete failure of the first nesting attempts. Similar to 2005, the diet of terns nesting at the Dungeness colony consisted of about 20-25% salmonid smolts. This year's research team included **Dan Roby** (OSU/USGS), **Kirsten Bixler** and **Jessica Adkins** (OSU), **John Piatt** (USGS), **Ken Collis** (Real-Time Research), and a number of volunteers. The study was funded by the U.S. Fish and Wildlife Service (USFWS).

COASTAL COLONIES

Craig Strong (Crescent Coastal Research, CCR) reports that seabird colonies on the Oregon coast had a strikingly delayed nesting effort. This appar-

ently was a response to protracted winter storms into May and lack of the spring upwelling. They initially predicted widespread nesting failure, but cormorants and murres began nesting in mid-June. Murres were still fledging young into late July and August, and cormorants in September. Upwelling was unusually strong and persistent in July and August, which was hypothesized as a causative factor in the large, anoxic benthic "dead zone" reported for the inner shelf waters of central Oregon (*The Oregonian* and other news media). The dead zone did not appear to affect seabird numbers.

Graduate student **Eric Anderson** is doing field studies of Surf (*Melanitta perspicillata*) and White-winged Scoters (*Melanitta fusca*) under **Jim Lovvorn** at the University of Wyoming. The research includes three main components. First, in northern Puget Sound he is using data on food availability, diet, foraging behavior, and body condition to evaluate the role of alternative benthic habitats (particularly eelgrass beds) for scoters during molting, wintering, and spring staging periods. Second, he is using diet and condition data in the Puget Sound-Georgia Basin and southeast Alaska to clarify the role of herring spawn vs. alternative foods for spring conditioning of scoters. Third, with multiple collaborators, Eric is using reproductive tissues collected from breeding areas in Alaska and Canada to estimate the contributions of marine vs. freshwater foods to breeding efforts of White-winged Scoters. In support of the field and modeling studies of Spectacled Eiders and of scoters in Puget Sound and San Francisco Bay, graduate student **Samantha Richman** is continuing her captive work on the energy costs of diving by White-winged Scoters.

MARbled MURRELETS

Martin Raphael and **Tom Bloxton** of the U.S. Department of Agriculture Forest Service, Pacific Northwest Research Station in Olympia, WA, continued collaborative studies on Marbled Murrelets (*Brachyramphus marmoratus*) in Puget Sound, Strait of Juan de Fuca, and Hood Canal during 2006. The

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seventh year of long-term population monitoring of Marbled Murrelets at sea under the Northwest Forest Plan (NWFP) was completed, along with researchers elsewhere in Washington, Oregon, and northern California. The NWFP is a large-scale ecosystem management plan for federal land in the Pacific Northwest of the U.S. Raphael and Bloxton surveyed murrelets and other seabirds and marine mammals in Recovery Zone 1, from the San Juan Islands to Olympia in Puget Sound and the Strait of Juan de Fuca. They also continued collecting baseline data on within-season and annual changes in distributions, densities, and productivity indices of murrelets in the San Juan Island archipelago.

The third full season of capturing and radio-tagging murrelets at sea around the Olympic Peninsula, Washington yielded 40 tagged adults, but resulted in the location of only 2 nests, both on Vancouver Island, British Columbia. This is at least the second consecutive year of low nest initiation rates in this radio-tagged population. This work was completed with support and cooperation from **Richard Bigley** of WDNr, **Deanna Lynch** of USFWS, and **John Calhoun** of the Olympic Natural Resources Center.

Terry Carten, **Peter McBride** and **Lisa Egtvedt** of the Washington Department of Natural Resources (WDNR), Northwest Region, continued inland surveys. WDNR contracted with Turnstone Environmental Consultants, Inc. (TEC) and Hamer Environmental to survey 99 sites (567 surveys). They delineated 3300 acres of potential Marbled Murrelet habitat in the field. Surveys and field work during the 2006 season were concentrated on state lands in the Cascade Range of Whatcom, Skagit and Snohomish counties.

WDNR's Northwest Region initiated a project on a possible alternate survey methodology for high-elevation sites in the North Cascades (above 3000 feet). We are investigating a method that is safer and more logistically manageable for determining Marbled Murrelet occupancy, under the guidance of the PSG Inland Survey Protocol. Ten surveys

were conducted as a test of new survey techniques models for high sites.

TEC initiated a 2-year Marbled Murrelet contract for the Washington Department of Natural Resources (WDNR)'s Northwest Region, in the western foothills of the northern Cascade Range. The goal was to conduct intensive and biologically acceptable surveys for Marbled Murrelets using PSG's survey protocol, in support of WDNR's habitat conservation plans on state forest lands. The project included extensive pre-season Marbled Murrelet habitat delineation; 56 first-year sites were examined via 327 surveys. Marbled murrelets were present at 13 sites, and "occupied" behavior was recorded at 4 sites. **Jeff Reams** was the TEC project manager. Biologists **Terry Carten** and **Peter McBride** served as WDNR's district representatives; Carten was the WDNR contract administrator.

TEC biologists **Tom Williamson** and **Devin Sahl** also consulted with the Bonneville Power Administration (BPA) in southwest Washington on a power line project in order to minimize impacts to murrelet habitat. **Barry Keller** was the BPA contract administrator.

Craig Strong (Crescent Coastal Research, CCR) and crew **Brendan O'Connor**, **Ryan Terrill**, and **Jessi Hallman** also continued population assessment surveys under the NWMP. Southern Oregon surveys were a cooperative effort with the US Forest Service's Redwood Sciences Lab (**Sherri Miller**, **Elias Elias**) and the USFWS Arcata office (**Gary Falxa**). Murrelet numbers may have been slightly lower than in prior years, but not significantly so; analysis is pending. Sightings included detection of two Long-billed Murrelets (*Brachyramphus perdix*) among Marbled Murrelets near Crook Point in southern Oregon. Murrelets appeared to have a late season, in which few fledglings were detected at sea until the end of July; this paralleled trends in coastal seabird colonies [see "Coastal colonies" in this Oregon-Washington report].

Turnstone Environmental Consultants (TEC) conducted Marbled Murrelet surveys on state lands in the Coast

Range of Oregon. The Oregon Department of Forestry (ODF) contracted with TEC to survey 6 ODF districts: Astoria, Tillamook, Forest Grove, Western Lane, Coos Bay and West Oregon. The surveyors visited a mixture of first-, second- and multi-year sites; they conducted over 1600 surveys at 207 unique sites and 833 unique stations, using PSG's 2004 protocol requirements. Murrelets were present during 186 surveys, and "occupied" behavior was observed during 35 surveys. **Tom Williamson** was the TEC project manager. District representatives for ODF were **Jenny Laughman** in Astoria, **Kate Skinner** in Tillamook, **Laurie O'Nion** in Forest Grove, **Tom Mickel** in Western Lane, **Ryan Greco** in Coos Bay and **Eric Foucht** in West Oregon. **Matt Gostin** was the ODF contract administrator and primary contact.

TEC continued a multi-year Marbled Murrelet contract to survey birds and develop harvest plans on timber company properties in the Coast Range of central Oregon. Twenty surveys were performed at eight sites, using the PSG survey protocol. **Jeff Reams** was the Turnstone project manager.

The Marbled Murrelet Effectiveness Monitoring Team continued to monitor the status and trends of Marbled Murrelet populations and nesting habitat in California, Oregon and Washington, as part of an interagency program to evaluate the effectiveness of the NWFP. A report on the first 4 years of the murrelet monitoring project was completed. "Northwest Forest Plan—The First 10 years (1994-2003): Status and Trend of populations and Nesting Habitat for the Marbled Murrelet" can be accessed online at http://www.fs.fed.us/pnw/pubs/pnw_gtr650.pdf. The report's six chapters include contributions from 13 scientists from the 3 states, with **Mark H. Huff**, **Martin G. Raphael**, **Sherri L. Miller**, **S. Kim Nelson**, and **Jim Baldwin** as technical coordinators. Chapters include a literature review of Marbled Murrelet biology; population status and trend results from 2000 through 2003 at-sea population surveys; and two nesting habitat modeling efforts (using systematic

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ground-based vegetation inventories, and interpreted satellite imagery). This major report represents the findings of Marbled Murrelet monitoring during the first 10 years of the NWFP. Marbled Murrelets have been monitored annually in coastal waters adjacent to the NWFP area since 2000, using a single methodology. The murrelet population estimate for this area, based on the years 2000-2003, is about 22,000 birds, with a 95% confidence interval for this estimate of 18,500 to 29,000 birds. The four years of survey data was insufficient to evaluate whether Marbled Murrelet population in this area changed significantly. These and other results are detailed in the 2006 report.

Mark Huff has left the USFWS to take a job with the National Park Service in Washington, and **Gary Falxa** of the USFWS office in Arcata, California has taken over as coordinator for the NWFP murrelet effectiveness monitoring program.

NORTHERN CALIFORNIA

Compiled by **Esther Burkett**

COLONY MONITORING

Josh Adams and **John Takekawa** of the U.S. Geological Survey, Western Ecological Research Center (USGS-WERC) continued work on Scorpion Rock in the Channel Islands National Park (CINP). They investigated reproduction, behavior, and trends in mist-net capture rates and mark-recapture for Ashy Storm-Petrels (*Oceanodroma homochroa*) and Cassin's Auklets (*Ptychoramphus aleuticus*), and breeding success of Western Gull (*Larus occidentalis*). Foraging of Ashy Storm-Petrels was studied by radio-telemetry [see Pelagic Studies section of the Northern California report].

Common Murres (*Uria aalge*), Brandt's Cormorants (*Phalacrocorax penicillatus*), and other seabirds were monitored by **Gerry McChesney** (U.S. Fish and Wildlife Service; USFWS), **Rick Golightly** (Humboldt State University), **Steve Kress** (National Audubon

Society), and **Harry Carter** (Carter Biological Consulting), at Point Reyes, Point Resistance, Miller's Point Rocks, and Double Point Rocks. In addition, they recorded human disturbance to seabirds as part of the *T/V Command* Seabird Colony Protection Program.

Annual aerial photographic surveys of murre and cormorant colonies in northern and central California were conducted in cooperation with CDFG (Paul Kelly and Air Services). These surveys indicated a fairly large nesting effort for Brandt's Cormorants and high attendance of murres at many colonies in 2006, despite purported low prey availability.

PRBO Conservation Science (**Russ Bradley**, **Julie Thayer**, **William Syde-man**, and **Pete Warzybok**) continued their long-term colony-based research on the Farallones, Año Nuevo Island, and Alcatraz Islands. Cassin's Auklet populations were reduced and the species experienced almost complete breeding failure for the second year in a row, presumably due to delayed upwelling and resulting poor availability of plankton prey during key periods. Ashy Storm-Petrels were mist-netted in high numbers on the Farallones, but their productivity was near the long-term mean. Several Ashy Storm-Petrels and Fork-tailed Storm-Petrels (*O. furcata*) were observed at Año Nuevo this year. A Black Storm Petrel (*O. melania*) was also captured on the Farallones in April. Piscivorous species had varying breeding success. Pelagic Cormorant (*Phalacrocorax pelagicus*) breeding populations were reduced and experienced poor to almost complete failure. Pigeon Guillemot (*Cephus columba*), Common Murre, and Rhinoceros Auklet fared poorly, with productivity less than the long-term means. The murre population grew by 15% on the Farallones, where estimated populations now exceed 210,000, while guillemot populations were lower than in previous years on all three study islands. Brandt's Cormorant populations continued to increase, as in the past several years. Brandt's breeding success in the past two years has been similar to or higher than the short-term mean on Año Nuevo and the Farallon

Islands, but lower on Alcatraz. This is in contrast with the late 1990s to early 2000s, when estuarine-breeding cormorants on Alcatraz performed better than at the coastal and pelagic colonies. Presumably the differences were linked to different prey species and availability. Diet of piscivorous seabirds and predatory fish on the shelf consisted mainly of anchovy in 2006 (Engraulidae). Juvenile rockfish (*Sebastes* spp.) are an important forage species for predators in this region, but few to no rockfish were present in diets this year.

Double-crested Cormorants (*Phalacrocorax auritus*) were monitored at a new colony in Tomales Bay. The project coordinator was **John Kelly** (Cypress Grove Research Center, Audubon Canyon Ranch); collaborators included **Ben Becker** and **Sarah Allen** of Point Reyes National Seashore and **Mark McCaustland** of Audubon Canyon Ranch. Double-crested Cormorants colonized Hog Island in Tomales Bay in 2001. The birds are nesting in non-native cypress and eucalyptus trees that cover the small island. The colony has increased dramatically since its inception, from 12 active nests in 2001 to 328 nests in 2006. Point Reyes National Seashore restricted access to the island beginning in 1998; camping was eliminated and signs were posted. No previous seabird nesting records exist for the island, but it has long been a roosting site for seabirds such as cormorants, gulls, and pelicans, particularly during winter months.

The use of salt ponds by foraging and nesting seabirds is being studied in south San Francisco Bay by **Nicole Athearn**, **John Takekawa** (USGS-WERC), and **Joelle Buffa** (USFWS), and **Don Edwards** (San Francisco Bay National Wildlife Refuge). They began in September 2005 to examine bird use of ponds where salt production still takes place. These ponds are located within the landscape of other salt ponds that are now open to tidal action; some of the enclosed ponds will also be restored to tidal action. Birds at the ponds are primarily gulls (*Larus* spp.) and terns (*Sterna* spp.). The first year of surveys

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indicates that while some salt ponds are heavily used by shorebirds for foraging and roosting, many of the ponds operated for evaporation of salt have limited value for other foraging birds. Expanding numbers of California gulls (*Larus californicus*), especially near landfills, may also be limiting use of these areas by other birds.

MARBLED MURRELETS

The Pacific Lumber Company (PALCO) has continued to monitor Marbled Murrelets (*Brachyramphus marmoratus*) since the signing of the PALCO Habitat Conservation Plan (HCP) in 1999. The monitoring takes place in the company's Marbled Murrelet Conservation Areas (MMCAs). The Headwaters Forest Reserve (HFR) and Humboldt Redwoods State Park (HRSP) are also monitored; these non-harvested areas serve as controls to gauge any changes in the MMCAs. PALCO has also funded several research projects to better understand the biology of the murrelet, including conservation genetics of murrelets in northern California (led by **Vicki Friesen** and **Tim Birt**, Department of Biology, Queen's University, Ontario, Canada).

David Bigger led inland monitoring projects in northwestern California. Collaborators included **Sal Chinnici** (PALCO) and **Steven P. Courtney** (Sustainable Ecosystems Institute). Most murrelets that were tracked by radar were in HRSP, and in the Allen Creek MMCA on PALCO lands. The maximum number of detections in one survey was 86, on 26 July in HRSP. One hundred eight audio-visual survey visits were conducted during the 2006 season. Surveyors observed "occupied" behaviors in all MMCAs, HRSP, and HFR; and the maximum number of detections in one survey was 75, on 16 June in the Bell-Lawrence MMCA.

Researchers at the University of California, Berkeley (UCB) used genetic tagging to investigate whether murrelets in central California represent a sink population. The study was led by **Per Palsbøll**, in collaboration with **M. Zachariah Peery** and **Steven R.**

Beissinger. A collaborator has been **B. H. Becker** (Pacific Coast Science and Learning Center, Point Reyes National Seashore).

PALCO funding under the HCP contributed to the publication of three papers in 2006: two on audiovisual and radar surveys of murrelets in the *Journal of Wildlife Management*, and one on demographic and count-based analysis source-sink dynamics in *Ecological Applications*.

RESTORATION PROJECTS

The Common Murre Restoration Project (CMRP) completed its 11th year of seabird restoration and monitoring of nearshore colonies in central California, with funding from the *Apex Houston* and *Command* Trustee Councils. CMRP is a collaborative effort primarily involving the USFWS (**Gerry McChesney**), Humboldt State University (**Rick Golightly**), National Audubon Society (**Steve Kress**), and Carter Biological Consulting (**Harry Carter**), with additional cooperation from the California Dept. of Fish and Game (CDFG), National Oceanic and Atmospheric Administration, U.S. Geological Survey-Western Ecological Research Center, and Point Reyes National Seashore. Field biologists included **Danielle LeFer** (USFWS), **Lisa Eigner**, **Travis Poitras**, **Peter Kappes**, **Nate Jones**, **Deasy Lontoh**, and **Phil Capitolo**.

Our primary focus continues to be the restoration of the formerly extirpated Common Murre (*Uria aalge*) colony on Devil's Slide Rock (DSR), San Mateo County. No social attraction was conducted at DSR in 2006, for the first year since 1996. We estimated that 361 murre pairs nested on the rock in 2006, a 120% increase from 2005 and 90% higher than in 2004. However, productivity was low, apparently because of low prey availability. The murre colony at Castle Rocks and Mainland, Monterey County, suffered low productivity mainly due to Brown Pelican (*Pelecanus occidentalis*) disturbance. This form of disturbance is now a near-annual occurrence at this southernmost active murre colony. We also monitored several colonies [see

that section of the Northern California report].

Habitat restoration on Año Nuevo Island is being carried out by **Michelle Hester** (Oikonos-Ecosystem Knowledge) and **Julie Thayer** (PRBO Conservation Science). Collaborators include the California Department of Parks and Recreation, Año Nuevo State Reserve; Go Native; and the University of California, Santa Cruz. The project has been successful in protecting one of California's three principal breeding colonies of Rhinoceros Auklets (*Cerorhinca monocerata*). Field techniques are being tested to improve habitat quality for burrow-nesting seabirds. The proportion of occupied auklet burrows that collapsed and/or experienced erosion significantly decreased after restoration efforts. Future work to protect the colony will involve reducing trampling of burrows by California sea lions (*Zalophus californianus*) and adaptive planting.

MORTALITY AND POLLUTION STUDIES

The Beach Watch Program continued within the Gulf of the Farallones and Monterey Bay National Marine Sanctuaries. Beach Watch surveyors conduct counts of live and dead wildlife, document demographics of beached wildlife, sample oiled specimens, notify the sanctuary of the status of streams and lagoons, and document visitor-use patterns and violations. They also retrieve tar balls to assist the California Department of Fish and Game's Office of Spill Prevention and Response (CDFG-OSPR) to detect the source of oil on coastal beaches. Shoreline surveys have been conducted by Beach Watch in the Gulf of the Farallones and Monterey Bay National Marine Sanctuaries since the fall of 1993, spanning 150 miles (240 kilometers) of coast from Point Año Nuevo in San Mateo County north to Bodega Head in Sonoma County. The 2005 Annual Report is available at <http://farallones.noaa.gov/research/beachwatch/>

Although 2006 data are still preliminary, for some species there appears to be a decline in oiled beached birds: loons (*Gavia* spp), Western and Clark's

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Grebes (*Aechmophorus occidentalis* and *A. clarkia*), Northern Fulmar (*Fulmarus glacialis*), and gulls (*Larus* spp.), but an increase in the number of oiled Common Murres. Total numbers and rates of oiled birds have been slowly decreasing since the cleanup of the *Jacob Luckenbach* spill in 2002. Numbers of alcids and cormorants have peaked during the post-breeding and fledging months of August through October. In 2007, Beach Watch staff will develop systems for expediting data entry and data availability. For more information contact Jan Roletto (Jan.Roletto@noaa.gov) or Shannon Lyday (slyday@farallones.org).

May 2007 will mark the 10th year of the Coastal Ocean Mammal/ Bird Education and Research Surveys (COMBERS) coordinated by **Hannah Nevins** and **Jim Harvey** of Moss Landing Marine Laboratories (MLML). This beach survey program is designed to monitor mortality of marine birds and mammals, using citizen scientists who collect systematic data during monthly surveys in the Monterey Bay National Marine Sanctuary. This work is supported by the Science Integrated Monitoring Network). During 2005, COMBERS found increased deposition of many resident breeding species, including Brandt's Cormorants, Common Murres, Rhinoceros, and Cassin's Auklets. Unusual species included three Horned Puffins (*Fratercula corniculata*), and four Tufted Puffins (*Fratercula cirrhata*). In 2006, COMBERS documented a "wreck" of Red Phalaropes (*Phalaropus fulicaria*) in January and again saw increased numbers of dead murres in late summer (July to September). Necropsies indicated that food-limitation was the primary cause of these mortality events.

A first-year Short-tailed Albatross was found dead on a beach near Morro Bay, California, in August 2006, surprisingly close to where a second-year bird was found dead in 2005. Both birds had been banded on Torishima by **Hiroshi Hasegawa** (Toho University).

The San Francisco Bay Bird Observatory is studying metal contamination in the bay. The Bay-Delta watershed has

a legacy of mercury contamination from both mercury mining and gold extraction. Preliminary results indicate high levels of mercury, particularly in Caspian terns (*Sterna caspia*) and Forster's terns (*Sterna forsteri*) breeding in south San Francisco Bay. The project coordinator is **Cheryl M. Strong** (San Francisco Bay Bird Observatory) collaborators are **Terry Adelsbach** and **Collin Eagles-Smith** USFWS—Environmental Contaminants Division, and **Josh Ackerman** (USGS).

The Central Coast Marine Bird Health Study was initiated in 2005 by **Dave Jessup**, **Tanja Zabka**, and **Melissa Miller** of the CDFG—Marine Wildlife Veterinary Care and Research Center, Santa Cruz (MWVCRC). The goal is to provide a quantitative assessment of disease and other mortality factors affecting seabirds in central California, using specimens of Common Murres (*Uria aalge*) and other seabirds recovered during beach survey programs and at rehabilitation centers. The study is based at MWVCRC, which provides a regional information center for federal, state, and local resource managers. The work is supported by CDFG—OSPR. In the first two years, we systematically quantified causes of mortality based on necropsies (145 in 2005 and 227 in 2006). Although natural mortality factors comprised a significant proportion of determined cases (68%), anthropogenic causes of mortality such as chronic oiling, trauma, and fishery interactions continue to be considerable (~15%).

Help with specimen collection, necropsies, and data entry was provided by MLML students **Joelle Sweeney**, **Cori Gobble**, **Lisa Wertz**, **Brian Hoover**, and **Melinda Nakagawa** and MWVCRC volunteers **Brina Carey**, **Sandrine Hazan**, and **Erin Feinblatt**. Collaborators include **Russell Bradley** (PRBO), **Michelle Belizzi**, **Susan Kavaggia**, and **Marc Russell** (International Bird Research and Rescue), **Sue Campbell** (Monterey SPCA), and **Jan Roletto** (GFNMS).

PELAGIC STUDIES

Josh Adams and **Jim Harvey** (Moss

Landing Marine Laboratories) together with **H. Nevins**, **D. Hyrenbach**, and **C. Baduini** (Claremont Colleges) continue a third season of satellite telemetry studies investigating the movements and migration of Sooty Shearwater (*Puffinus griseus*) captured in the Monterey Bay National Marine Sanctuary (Sanctuary Integrated Monitoring Network). Live tracking and archived data can be viewed at www.seaturtle.org/tracking

Adams and **Takekawa** report that a two-year radio-telemetry study of Ashy Storm-Petrels (*Oceanodroma homochroa*) captured at three islands in the Channel Islands National Park has revealed persistent foraging in areas of the western Santa Barbara Channel, Santa Cruz Basin, with post-breeding dispersal to central California waters.

The following projects by northern California researchers are described in the Hawaii and Pacific Regional Report: telemetry of the Hawaiian Dark-rumped Petrel (**Josh Adams**, **David Ainley**, and collaborators); telemetry of Black-footed Albatrosses (**Michelle Hester**, **Josh Adams**, **Cheryl Baduini**, and co-investigators); Pink-footed Shearwater migration (**Peter Hodum**, **David Hyrenbach**, **Josh Adams**, and collaborators); and a variety of projects under Tagging of Pacific Pelagics (**Scott Shaffer** and co-workers).

Jim Lovvorn's lab at the University of Wyoming has initiated studies on Cassin's Auklets (*Ptychoramphus aleuticus*) related to their foraging ecology in the Channel Islands, California. **Samantha Richman** has raised a captive flock of these auklets to be used in measuring the joint costs of thermoregulation and diving. Lovvorn has begun working with hydroacoustics data supplied by **Don Croll** to develop ways of modeling the 3-dimensional patch structure of the auklets' krill prey for use in foraging models.

EDUCATION AND OUTREACH

In 2005 and 2006, many public outreach and classroom programs were developed that incorporated ocean conservation and research on Black-footed

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Albatrosses (*Phoebastria nigripes*). The project was coordinated by **Carol Keiper**; collaborators were **Jennifer Stock** (Education Outreach Specialist, Cordell Bank National Marine Sanctuary), **David Hyrenbach** (Duke University), and the Benicia Water Education Program. A major goal was to encourage stewardship of ocean ecosystems. Through lectures, workshops, coastal cleanup events, and classroom activities, hundreds of people in the San Francisco Bay and Monterey Bay area learned about the need for preventing plastic pollution. Teaching activities and curriculum are available on-line at <http://www.oikonos.org/projects/oceanstewardship.htm>. The work was funded by the California Coastal Commission Whale Tail Grant Program, Cordell Bank National Marine Sanctuary, and the City of Benicia.

In 2007, a teacher training and classroom program called ACES (Animals in Curriculum-based Ecosystem Studies) will be launched by Signals of Spring, Cordell Bank NMS, Oikonos, and Duke University. ACES will use albatross satellite tracking research as a model and add more marine species in the following years. This 3-yr program is funded by NOAA's Environmental Ocean Literacy Program towards the goal of highlighting conservation issues in the National Marine Sanctuaries.

OTHER WORK

Sean Boyd (Canadian Wildlife Service, Delta, BC) is coordinating a count of Eared Grebes (*Podiceps nigricollis*) on Mono Lake, California in October. This is a collaborative effort with the California Department of Fish and Game—they do the flying and take the photos, and Boyd counts the birds. This is concurrent with a similar count on Great Salt Lake, Utah.

Esther Burkett (California Department of Fish and Game) evaluated the petition received the state of California to delist the pelican under the California Endangered Species Act. Action on the petition by the California Fish and Game Commission is scheduled for December

in Santa Monica. Burkett also oversaw contract work by **Frank Gress** and others on the California Brown Pelican (*Pelecanus occidentalis californicus*) [see report for southern California].

SOUTHERN CALIFORNIA

Compiled by **Dan Robinette**

Charles Collins (California State University, Long Beach) continues to monitor breeding and population dynamics of California Least Terns (*Sterna antillarum browni*) at Seal Beach. He and Mike Horn hope to have a compendium of papers from studies at the Bolsa Chica Ecological Reserve finished up this fall. Publications for 2006 include two papers in *North American Bird Bander* summarizing long-term banding studies of Caspian Tern (*Sterna caspia*) and Elegant Tern (*Sterna elegans*). In both studies, there were considerable inter-colony movements between Los Angeles, Orange and San Diego Counties. Two other writing projects, on Royal Tern (*Sterna maxima*) survival and kleptoparasitic Snowy Egrets (*Egretta thula*), will appear this fall the *Journal of Field Ornithology* and *Waterbirds*, respectively.

Cheryl Connel (Biologist, Orange County) is working with **Dan Robinette** (PRBO Conservation Science) and **Kathy Keane** (Keane Biological Consulting) to monitor the diet of California Least Terns breeding at the Port of Los Angeles. In 2006, Connel collected feces bi-monthly from early May to early August. Fish otoliths and scales will be sorted from the feces during the fall and winter. Robinette also collected diet samples at the Venice Beach colony with the help of **Tom Ryan** and **Traci Caddy** (Foothill Associates). The goal of this study is to develop a long-term data set on Least Tern diet for multiple colonies in southern California.

Mike Horn (California State University, Fullerton) continues to work with his students to monitor Caspian Tern, Elegant Tern, and Black Skimmer (*Rhynchops niger*) foraging and diet at Bolsa Chica and at the South Bay Salt Works

in San Diego County. Recent emphasis has been placed on Elegant Terns, by far the most abundant of the terns nesting in southern California. In this regard, **Kelly Connell** will complete her MS thesis this fall on the response of Elegant Terns to changing ocean conditions and prey populations. She has used 12 years of dietary data (1993-2004). Her results support a warm-to-cool regime shift in the late 1990s, and they show the value of the tern as a bioindicator of climate and prey fluctuations. Horn and Charles Collins are finishing a volume of *Studies in Avian Biology*, a series of papers on food and foraging of nesting terns and skimmers in southern California.

Phil Capitolo, **Jeff Davis**, and **Laird Henkel** of the University of California at Santa Cruz (UCSC) are continuing aerial photographic surveys of Brandt's and Double-crested Cormorant (*Phalacrocorax penicillatus* and *P. auritus*) colonies in southern California, under contract with California Department of Fish and Game's Office of Spill Prevention and Response (CDFG-OSPR; **Julie Yamamoto**). **Breck Tyler** (UCSC) is the principal investigator. These surveys are continuing the series of cormorant surveys that were conducted from 1991 to 2003 by Humboldt State University, and are scheduled through 2007.

Phil Capitolo, in collaboration with **Deborah Jaques** (Pacific Eco Logic), conducted aerial and ground surveys to determine patterns of roost use by Brown Pelican (*Pelecanus occidentalis*) at San Nicolas Island, under contract with U.S. Navy (**Grace Smith**).

Dan Robinette and **Julie Howar** (PRBO Conservation Science) completed the eighth year of seabird monitoring at Vandenberg Air Force Base (VAFB). Studies focus on the breeding and population dynamics of Pigeon Guillemots (*Cepphus columba*), Brandt's and Pelagic Cormorants, Western Gulls (*Larus occidentalis*), Black Oystercatchers (*Haematopus bachmani*), and California Least Terns. Diet and foraging data are also collected where possible. Results from these studies have led to the following findings: (1) Pigeon Guillemots are good indicators of spatiotemporal variation in

sanddab (*Citharichthys* sp.) recruitment in nearshore waters off VAFB (in review, *Marine Ecology Progress Series*); (2) the foraging habits of seabirds and marine mammals can be used to test the efficacy of marine reserves (in progress); and (3) the reproductive success of Least Terns at VAFB is strongly correlated with the percent frequency of anchovies (Engraulidae) in their diet, which indicates that Least Terns at VAFB are potentially good indicators of local anchovy abundance. Data on roost habitat utilization by California Brown Pelicans are also collected year-round. Results from this study show that diversity in habitat use is related to local anchovy abundance and sea surface temperature.

Jeff Davis, Laird Henkel, Brad Keitt, Tonya Haff, and Glenn Ford (University of California, Santa Cruz; Breck Tyler, Principal Investigator) are continuing to conduct aerial surveys of marine birds and mammals in California continental shelf water, under contract with CDFG-OSPR. The surveys are designed to collect baseline distribution and abundance data and to maintain rapid-response capabilities for oil spills. Work during the past year focused on waters off San Mateo, Santa Cruz, and Monterey counties. The team also conducted nearshore surveys in Monterey Bay to compare the effectiveness of aerial and boat-based survey methods for detecting Marbled Murrelets (*Brachyramphus marmoratus*).

Josh Adams and John Takekawa (USGS-WERC) are finalizing a comprehensive and interactive GIS database detailing results from large-scale aerial marine bird surveys off southern California. Collaborators include Humboldt State University, Minerals Management Service, and others).

Frank Gress (California Institute of Environmental Studies; CIES) and Laurie Harvey (CIES and San Diego State University) continued work on California Brown Pelican population status and food habits in the Channel Islands of southern California.

NON-PACIFIC UNITED STATES

Compiled by **Melanie J. Steinkamp**

Under the guidance of **Patrick Jodice** of the U.S. Geological Survey Cooperative (USGS) Research Units and Clemson University (CU), research continued on seabird colonies in South Carolina. **Lisa Ferguson** (CU) completed her MS research, in which she measured growth rates and adrenocortical response of Brown Pelican (*Pelecanus occidentalis*) chicks in relation to ectoparasite infestations at two colonies in South Carolina. In 2006 she began PhD research at Clemson focusing on behavioral and physiological responses of seabirds to disturbance. **Elena Sachs** (CU) measured survival rates of Brown Pelican chicks in relation to feeding frequency at two South Carolina colonies. Sachs is also determining proximate composition and energy density of seabird prey from nearshore waters. **Lisa Wickliffe** (CU) completed her first field season examining the relationship between seabird foraging activities and commercial shrimp trawling activity. **Joyce Stuckey** (College of Charleston) completed her MS, which measured levels of contaminants in pelican eggs from two colonies in South Carolina.

Robin M. Overstreet and graduate students **Stephen Curran, Stephen Bullard, and Hongwei Ma** are continuing to work on helminths of birds and other host groups. Overstreet's group is based at the Gulf Coast Research Laboratory, The University of Southern Mississippi (USM), Ocean Springs. Last year was primarily spent dealing with Hurricane Katrina, but in 2005 two papers on pelican parasites were published, one on all the known parasites from the American White Pelican (*Pelecanus erythrorhynchos*) with **Stephen Curran**, and one on a new fluke from the Brown Pelican in Costa Rica with **David Zamparao** and **Daniel Brooks** (University of Toronto). Another paper was published on a fluke infecting the green heron (*Butorides virescens*), which has a larval stage that kills or harms a variety of fishes, in-

cluding endangered species. Coauthors for this work were **Andrew Mitchell** (U.S. Department of Agriculture, Stuttgart, Arkansas), **Andrew Goodwin** (University of Arkansas, Pine Bluff), and **Thomas Brandt** of the U.S. Fish & Wildlife Service (USFWS), San Marcos, Texas. Studies on that fluke and others are continuing with Curran and the other personnel. Also submitted in 2006 was a manuscript with Bullard for a book chapter on bird flukes that cause harm to fishes. Research is presently underway at USM on bird parasites with larval stages in fishes that have been influenced by Hurricane Katrina, (with students and **Richard Heard**), on several species of the roundworm genus *Contracaecum* of aquatic birds (with Ma), and on a continuing investigation of various parasites that infect birds of Lake County, Oregon (with personnel at the Summer Lake Wildlife Area in that state).

Jeff Spendelow of the USGS-Patuxent Wildlife Research Center (PWRC) continues to coordinate a long-term cooperative research project on the metapopulation dynamics and ecology of endangered Roseate Terns (*Sterna dougallii*) in the Massachusetts-New York region. In 2006 he conducted breeding season fieldwork in Buzzards Bay, Massachusetts (BBMA), in collaboration with the Buzzards Bay Tern Project staff under the direction of **Carolyn Mostello** (Massachusetts Division of Fisheries & Wildlife). In August Spendelow worked with staff and volunteers of the Coastal Waterbird Program (now directed by **Becky Harris**) of the Massachusetts Audubon Society to resight and identify banded Roseate Terns at several sites from the east side of BBMA around the northern and eastern sides of Nantucket Sound. From 2004 to 2006 more than 1500 adult Roseate Terns have been color-banded at the 3 colony sites on BBMA. A preliminary analysis of data on the individuals trapped and/or resighted at Penikese Island from 2003 (when this site was colonized by Roseate Terns) to 2006 indicates that relatively few birds have developed "colony-site fidelity" there. Work from late July to

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early September 2006 resulted in about 600 identifiable sightings of more than 200 different individuals. Several birds were sighted either at 3 different places, or at Point A, Point B, and back at Point A again, suggesting that at least some individuals may be making multiple trips around Nantucket Sound during the post-breeding dispersal period. More systematic research is needed to determine to what extent Roseate Terns may be moving through the Horseshoe Shoals area of Nantucket Sound, where a wind turbine array has been proposed.

A range of studies is underway by **Jim Lovvorn** and his students at the University of Wyoming in Washington and Alaska [see regional reports for those areas].

Melanie Steinkamp, Tim Jones, and Scott Johnston (USFWS, Atlantic Coast Joint Venture and Migratory Bird Programs) convened a workshop to identify the top research and survey priorities for marine birds in the western Atlantic. The workshop resulted in the kickoff of the Northwestern Atlantic Birds At Sea Conservation Cooperative, a new, multi-disciplinary effort to address the needs of marine birds in the western Atlantic. Several important management priorities for marine birds were identified and agreed upon among the diversity of partners in attendance. The effort will focus on implementing research and monitoring projects to gain knowledge about numbers of marine birds along the Atlantic coast, and their distributions in the nearshore and offshore environments. The goal is to better understand how populations are changing over time, and to identify and understand how factors such as threats at sea are influencing their distributions and populations. Planned activities for 2007 include identifying and implementing surveys on ships of opportunity, establishing a monitoring program for nearshore and offshore species, and developing a 5-year implementation plan.

The American Bird Conservancy (ABC) recently hired **Jennifer Arnold** as their full-time Seabird Program Director. This is a first step in expanding

ABC's seabird program and increasing efforts to conserve seabirds throughout the Western Hemisphere. ABC's seabird program focuses on eliminating the greatest threats to seabird populations through cooperative work with government agencies, other NGOs, and researchers in conservation, education, and advocacy. Current projects include work to reduce mortality of seabirds in fisheries, impacts of invasive species at breeding sites, and impacts of contaminants on seabird populations.

HAWAII AND THE PACIFIC

Compiled by **Linda Elliott**

HAWAIIAN ISLANDS

Michelle Kappes (formerly **Michelle Antolos**) studied the foraging ecology and energetics of Laysan and Black-footed Albatrosses (*Phoebastria immutabilis* and *P. nigripes*) at Tern Island, French Frigate Shoals, Northwest Hawaiian Islands. This was part of the Tagging of Pacific Pelagics (TOPP) program; cooperators were her Ph.D. advisors at the University of California at Santa Cruz (UCSC), **Dan Costa** and **Scott Shaffer**. This was TOPP's fourth consecutive season of tracking at Tern Island and the second for Michelle's thesis research. The movements of breeding adults were studied using satellite, geolocation, and GPS tags during the incubation and brooding periods; field metabolic rates were measured using doubly labeled water.

Scott Shaffer initiated a study at Midway Atoll National Wildlife Refuge to track fledgling dispersal of Black-footed Albatrosses using satellite transmitters. This work was done in collaboration with **Beth Flint, John Klavitter, and Barry Christenson** of USFWS in Hawaii. More studies are planned for 2007.

Lindsay Young continues her dissertation work on the population genetics and foraging ecology of Laysan Albatross at the University of Hawaii.

Brenda Zaun reports that the hatching success of Laysan Albatross on the

north shore of Kauai, including Kilauea Point National Wildlife Refuge, increased in 2006 due to an addition of 36 eggs taken from the U.S. Navy's Pacific Missile Range Facility (PMRF) on the south side of the island. Because of the potential of bird-aircraft collisions at PMRF, the Navy has had an abatement program for almost two decades, in cooperation with the United States Department of Agriculture's (USDA) Wildlife Services. In the past the abatement program included breaking albatross eggs. This is the second year of our partnership with the Navy on the "albatross egg swap." The Navy purchased an incubator to house the eggs, while the refuge biologist determined egg viability through candling on all refuge nests. Inviolate eggs were replaced with viable eggs under incubating adults. The program has been highly successful, and we plan to continue this beneficial partnership with the Navy in the future.

Also on Kilauea Point National Wildlife Refuge, the two pairs of Newell's Shearwaters (*Puffinus aruicularis newelli*) that have nested in artificial burrows since 1997 and 2001 have nested again in 2006. Both eggs hatched in July and the chicks are expected to fledge in October. Additionally, we are excited to report two more Newell's Shearwater nests on the refuge this year. One pair abandoned their egg and the other hatched. This species typically nests in burrows on the interior mountains on the island of Kauai, often on steep, vegetated, inaccessible slopes. These Newell's Shearwater pairs are believed to be descendants of chicks that were cross-fostered with Wedge-tailed Shearwaters (*Puffinus pacificus*) in the late 1970s. Nesting behavior is closely monitored with the use of a Trailmaster active infrared transmitter and camera, and with Passive Integrated Transponder (PIT) tags on each of the adults. The equipment allows us to determine previously unknown information about the nesting behavior of this species, including length of incubation and incubation shifts, chick provisioning frequency, times of arrivals and departure of adults, first emergence of chick from burrow, and overall paren-

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tal investment.

As part of a pilot study to learn more about hand-rearing albatross chicks, ten month-old Laysan Albatrosses were captured on Sand Island, Midway Atoll National Wildlife Refuge, and flown by chartered plane to Kauai, where they were hand-reared at Kilauea Point National Wildlife Refuge. This was part of our preparation for a project to expand the range of the endangered Short-tailed Albatross (*Phoebastria albatrus*). Chicks from the colony on Torishima Island, Japan would be reared on Mukojima Island for the purpose of establishing a reproductive colony there. The primary caretakers of the young birds were **Tomohiro Deguchi** and **Tomoko Harada**, Yamashina Institute of Ornithology, Tokyo, Japan, along with **Judy Jacobs** of the U.S. Fish and Wildlife Service (USFWS), Region 7. Others involved in the project included refuge biologist **Brenda Zaun**, and **Lindsay Young**, **Bonnie Call**, **Nona Hanapi**, and **Charla Sterne**.

AUSTRALIA AND NEW ZEALAND

Hannahrose Nevins (Oikonos-Ecosystem Knowledge) is coordinating a project to eradicate rats from four rat-infested seabird islands off the southwestern corner of Stewart Island. A team of conservationists, local "mut-tonbirders," and Maori landowners successfully deployed 7 tons of bait on Taukihepa (Big South Cape), Puke-weka, Rerewhakaupoko (Solomon), and nearby Mokonui (Big Moggy). The goal is to allow for the recovery of the Sooty Shearwater (*Puffinus griseus*) and a range of endangered species, and the restoration of the islands' unique ecosystem. University of Otago researchers **Henrik Moller**, **Grant Harper**, and others have been studying the impacts of rats on shearwaters on these islands and documenting the project's results. A documentary film on the restoration project is expected to be completed in 2007. Support is being provided by the Command Oil Spill Trustee Council and the New Zealand Department of Conservation. Other collaborators include the Ka Mate nga Kiore

Incorporated Society, Rakiura Titi Islands Administering Body, Southcoast Productions, and Kia Mau Te Tit Mo Ake Tonu Atu research team.

Heidi J. Auman is writing up her doctoral research in the School of Zoology, University of Tasmania. The title is "Effects of anthropogenic food sources on the body condition, blood biochemistry, stable-isotopes and eggs in Silver Gulls (*Larus novaehollandiae*) in Tasmania," but better interpreted as "Supersize me: the effects of junk food on seagulls."

PELAGIC

Lisa Ballance and **Robert Pitman** of National Oceanographic and Atmospheric Administration (NOAA) Fisheries, La Jolla, California are conducting an at-sea survey of seabird distribution, abundance, and feeding ecology in the eastern tropical Pacific. They are covering 20 million km² of oceanic habitat between the US-Mexico border, Hawaii, and Peru as part of the Stenella Abundance Research Cruises. This is the 10th year of a 2-ship, 240-day study of the region's ecosystem and its variation in space and time. In addition to the at-sea survey, this year's research will include diet studies of Nazca Booby (*Sula granti*) on Malpelo Island, in collaboration with **Mateo Lopez-Victoria** of Colombia; stable isotope work to quantify diet for a suite of species, in collaboration with **L. Ignacio Vilchis** of the Scripps Institution of Oceanography; and a census of the breeding birds on Clipperton Island. Visiting scientists joining the cruise for one 20-day leg each will include **Tony Gaston** (National Wildlife Research Centre, Carleton University) and **Carl Safina** (Blue Ocean Institute). More information is at <http://swfsc.noaa.gov/prd-star.aspx>.

Josh Adams, **David Ainley** (HT Harvey and Associates), and **Holly Friefeld** (U.S. Fish and Wildlife Service), with the assistance of Haleakala National Park and State of Hawaii personnel, have initiated satellite telemetry studies on Hawaiian Dark-rumped Petrel (*Pterodroma phaeopygia*). Preliminary results

indicate that foraging flights during the chick-rearing period follow a wide, clockwise looping pattern from Hawaii to 50° N and throughout the North Pacific Transition Zone.

A total of 18 post-breeding Black-footed Albatrosses have been tagged off Cordell Bank National Marine Sanctuary in California and tracked across the North Pacific Ocean for up to 57 days. The tagged birds spent, on average, 60% of the time in international waters beyond national jurisdictions, and about 40% of the time within the U.S. Economic Exclusive Zone (EEZ). Some individual albatrosses also entered the EEZs of Japan, Russia and Mexico. Five of the tagged birds crossed the international dateline (the 180° meridian), and four reached Japan. The project coordinator is **Michelle Hester** (Oikonos-Ecosystem Knowledge); collaborators are **David Hyrenbach** (Duke University), **Josh Adams** (U.S. Geological Survey, Western Ecological Research Center), **Cheryl Baduini** (Claremont Colleges), and **Carol Keiper** and **Hannahrose Nevins** (Oikonos-Ecosystem Knowledge).

The Tagging of Pacific Pelagics (TOPP) program continues to study seabirds at multiple locations throughout the Pacific. TOPP conducted its fourth season of tracking at Guadalupe Island, Mexico, as part of **Bill Henry's** Ph.D. thesis. Henry is comparing the foraging ecology of Laysan Albatrosses in Mexico and Hawaii, advised by **Don Croll** of UCSC. In addition, Henry is examining the diet differences of the two populations using stable isotopic and the bioaccumulation of contaminants. TOPP will continue its tracking effort again this season at both locations, in order to study the interannual variations in foraging ecology.

TOPP researchers have also been studying the migration behavior of Sooty and Pink-footed (*Puffinus creatopus*) Shearwaters. In Oct-Dec 2005, returns for the first geolocation tags deployed on breeding Sooty Shearwaters in Jan-Mar 2005 were obtained at two locations in New Zealand. The tags recorded the migration routes of 19 birds as they headed to several destinations

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in the North Pacific. Overall, the birds traveled an average of 64,000 km round-trip in about 200 days! The complete results of this work were published in the Proceedings of the National Academy of Sciences in Aug 2006. Another season of tracking was conducted and tag recoveries are planned for Oct 2006. Researchers include **Scott Shaffer**, **Yann Tremblay**, and **Dan Costa** of UCSC; **Henri Weimerskirch** of the Centre National de la Recherche Scientifique in France; **Darren Scott** and **Henrik Moller** of the University of Otago, New Zealand; **David Thompson** and **Paul Sagar** of National Institute of Water and Atmospheric research, New Zealand; and **Graeme Taylor** of the Department of Conservation, New Zealand.

Michelle Kappes (formerly **Michelle Antolos**) will conduct a comparative study on Indian Yellow-nosed Sooty Albatrosses (*Thalassarche carteri*) and Dark-mantled Sooty Albatrosses (*Phoebastria fusca*) at Amsterdam Island, Indian Ocean in autumn 2006, in collaboration with her third Ph.D. advisor, **Henri Weimerskirch**. Kappes is also working French Frigate Shoal (see account for Hawai'i, above).

Pelagic movements of Pink-footed Shearwaters breeding in southern Chile are the subject of a multi-year project. **Peter Hodum** (Juan Fernández Islands Conservancy and Oikonus-Ecosystem Knowledge) and **Kirsten Lindquist** (Point Reyes Bird Observatory) deployed

geolocation tags on Pink-footed Shearwaters at the Juan Fernandez Islands in Feb 2005. Tags were recovered in Feb-Mar 2006 after nearly one year of deployment. Preliminary results showed that shearwaters remained within the Humboldt Current region instead of making the long trek to North Pacific waters off California. Another five Pink-footed Shearwaters breeding on Robinson Crusoe Island were tagged at the end of April 2006 and followed in their northward migration to the Peruvian shelf. While the duration of the solar-powered transmitters varied across individuals, one tag transmitted for over 100 days and the shearwater eventually reached Baja California.

Additional transmitter deployments are planned for the summer of 2007 to explore shearwater movements and habitats in their wintering grounds off southern California. This research is motivated by the North American Action Plan (NACAP) for the Pink-footed Shearwater, a marine species of common conservation concern for Canada, Mexico, and the United States. The research is coordinated by **Peter Hodum**; collaborators include **David Hyrenbach** (Duke University), **Ken Morgan** (Canadian Wildlife Service), **Josh Adams** (U.S. Geological Survey and University of Otago), and **John Huckabee** (Wildlife Veterinarian, Progressive Animal Welfare Society). The work is funded by NOAA

and the Commission for Environmental Cooperation.

NORTH ATLANTIC

Compiled from other reports

Ann Harding (USGS and Alaska Pacific University) continued work on Dovekies (*Alle alle*) in East Greenland with David Grémillet of the Centre d'Ecologie et Physiologie Energétiques (CNRS, France). This study is part of a collaborative effort examining the response of breeding dovekies to varying oceanographic conditions. Comparable studies are being conducted in Spitsbergen, led by Nina Karnovsky (Pomona College) and Geir Gabrielsen (Norwegian Polar Institute).

Nina Karnovsky (Pomona College) and her students are studying the reproductive and foraging behavior of Dovekies in Hornsund fjord, Spitsbergen. These data will be compared to those collected by Ann Harding on Dovekies breeding in East Greenland. Nina's student **Allison Bailey** spent one month in the Arctic collecting data for her senior thesis. **Jessica Kang Lee** and **Scott Zimmerman** are analyzing data on the at-sea distribution of Dovekies and the distribution of zooplankton, using ArcGis.

EXECUTIVE COUNCIL MINUTES

The Pacific Seabird Group's Executive Council (Exco) meets twice a year, at PSG's winter Annual Meeting and by conference call during the summer. After each meeting's Minutes are approved (at the next Exco meeting), the full minutes are available on the group's web site (www.pacificseabirds.org), and items of interest to the general membership are summarized in *Pacific Seabirds*.

SUMMARY OF MINUTES OF THE EXECUTIVE COUNCIL MEETING OF THE PACIFIC SEABIRD GROUP, 15 FEBRUARY 2006 Alyeska Prince Hotel, Girdwood, Alaska

PSG ADMINISTRATION

Financial report

The Treasurer reported that membership had risen and that the Society was financially healthy. The Annual Meeting has grown into an important contributor to the annual budget.

Elections

Results of the annual elections were announced [see "PSG News," *Pacific Seabirds* 33(1):40, 2006]. As usual, Exco discussed the need to improve methods to find nominees for office. All Exco members need to be more proactive in finding these nominees. Exco also discussed electronic voting, and decided to learn more about the possibilities that technology offers, so that an effective course of action can be taken.

FUTURE MEETINGS

PSG Meetings

The 34th Annual Meeting will be held in Asilomar, California, 7–11 February 2007.

The 35th Annual Meeting (2008) is proposed for coastal Washington. There are several possible locations currently being investigated. Dan Roby favors the Semiahmoo resort, with the Chair of the Local Organizing Committee still to be identified. Exco expressed general enthusiasm for this location. Proposed dates are 20–23 February 2008, but dates are not yet confirmed. [Editor's note: See "PSG News" in this issue for the latest information.]

International meetings

Dave Irons continued our discussion of the possibility of a World Seabird Conference (dubbed "Seabirds 2100"), perhaps in September 2010. The Exco emphasized the need to involve colleagues in the Southern Hemisphere, including groups that work with taxa such as albatrosses and penguins.

Motion approved: That Exco supports the idea of a World Seabird Conference in 2010 and encourages a Standing Committee composed of David Irons, Dan Roby, and Lisa Ballance to explore the idea and report back for the midyear Conference Call meeting. (Moved by David Irons, seconded by Katie O'Reilly; passed unanimously.)

Ron Ydenberg updated Exco on progress toward the conference "Pacific Seabirds 2006," to be held in Taiwan. Subsequently, this meeting was delayed to October 2007.

Motion approved: That Exco support in principle our role in "Pacific Seabirds 2006," as set out in Agenda Item 32 of the full Minutes. (Moved by Ron Ydenberg, seconded by Craig Harrison; passed unanimously.)

PSG PUBLICATIONS

Pacific Seabirds

The Editor of *Pacific Seabirds* Vivian Mendenhall presented her report. Concern was expressed about the rising costs of printing. Exco revisited the issue of sending hard copies vs. electronic copies of *Pacific Seabirds*, and decided that better notice to members of this point

will be required before sending of hard copies can be suspended.

Marine Ornithology

The Managing Editor of *Marine Ornithology* (MO), Tony Gaston, presented his report. At last year's Exco Meeting, PSG decided to provide support from the General Operating Fund for MO, if needed, of up to \$6000 each year in 2005, 2006, and 2007, to cover any shortfall in MO's production costs. Exco asked Tony for a more detailed budget next year to help with this reassessment. Exco also thanked Tony for his stellar service.

PSG Website

PSG Webmaster Lisa Ballance was unable to attend the meeting, but she submitted a report that posed several questions:

(1) *Pacific Seabirds*—Past volumes are now posted on the website. How current should this series be, and do we want to begin to make PS available online concurrent with publication? Exco advised that *Pacific Seabirds* should be kept current and posted.

(2) Photo Gallery and Resources Pages—should we restore them to the site? If so, what assurances can we make to guarantee that they (particularly the Resources Page) will remain up to date? Exco advised that the Gallery should be restored. Some sort of link-failure report will notify the webmaster of bad links.

(3) The current policy is that meeting Minutes will be posted in full as soon as they are approved and final. Should we

EXECUTIVE COUNCIL MINUTES

continue this? Exco advised that Minutes should continue to be posted only after final approval by Exco.

(4) Membership Directory—A student directory already exists and is posted on the Membership page. Shall we consider posting a general membership directory? Privacy is a concern. Similarly, there has been a suggestion to allow members to update their contact information on the website (see the OSNA site for an example). This can be done, if we would like to incorporate it as an option. Exco advised Ballance to post the membership directory, but to secure it for members only.

CONSERVATION ISSUES

The Vice-Chair for Conservation Craig Harrison presented the Conservation Committee report. The report was accepted by Exco, after some discussion of issues surrounding attempts to delist the Brown Pelican.

Motion approved: That Exco intends at its midyear Conference Call to vote on ratification of the petition to delist the Brown Pelican and solicits evidence for or against this action. (Moved by Katie O'Reilly, seconded by Ron LeValley; passed with 12 in favor, 0 opposed, 1 abstention)

TRAVEL AWARDS

Student Representative Shiway Wang noted that our society is becoming more international, as shown by the number of scientists (students and non-students) attending at this year's meeting from countries all over the world. Several motions concerning funding for students were put forward and withdrawn. Exco eventually decided to ask for a clear preamble to explain the issues of travel grants, to accompany a clear and simple motion for Exco's midyear Conference Call.

SUMMARY OF MINUTES OF THE EXECUTIVE COUNCIL MEETING OF THE PACIFIC SEABIRD GROUP, 7 SEPTEMBER 2006 By conference call

ACHIEVEMENT AWARDS

The Awards Committee nominated Michael Harris for The Lifetime Achievement Award

and Edward Melvin for The Special Achievement Award. Both were approved unanimously by the Exco.

TRAVEL AWARDS

Shiway Wang presented a detailed motion to revise PSG's system of Travel Award grants to students and others for travel to PSG's annual meetings. Under the new system, there will be three separate funds, which will offer small travel grants to: (1) students in the US or Canada; (2) students from countries other than the US or Canada; and (3) professional scientists or managers (not students) from countries other than the US or Canada. Money for these funds will come from separate sources, which will be, respectively, (1) proceeds from

the Silent Auction at the preceding Annual Meeting, (2) donations and grants to each Annual Meeting, and (3) a line item in the regular budget of each Annual Meeting. All recipients must present a paper or poster, and there are some restrictions on receiving the same award in successive years.

The new Travel Award program was approved unanimously by the Exco. [More information is in "PSG News" in this issue.]

CONSERVATION SMALL-GRANT PROGRAM

Bob Day and Craig Harrison presented a detailed motion to establish a PSG grant program for actions that would benefit the conservation of Pacific seabirds in developing nations. A separate PSG fund will be managed by a new Conservation Grant Committee, which will receive donations and decide on grant awards. An application process

will be set up. Award recipients will be required to submit a short report each year on their activities under the grant. The details of fund administration will be worked out in the future and will be discussed further at the next Exco meeting in February 2007.

The Conservation Small-grant Program was approved unanimously by the Exco. [More information is in "PSG News" in this issue.]

ENDORSEMENT OF PETITION TO DELIST THE BROWN PELICAN

At its meeting in February 2006 in Girdwood, the Exco discussed the issue of delisting of the Brown Pelican. It was decided at that time to seek further information, and to vote on the issue at its midyear conference call meeting. The Exco passed the motion to approve this endorsement (8 in favor, none against, 4 abstentions).

TREASURER'S REPORT

The Treasurer's Report covers the Pacific Seabird Group's past fiscal year, from 1 October 2005 to 30 September 2006.

MEMBERSHIP

As of December 31, 2006 PSG had:

	2005	2006
Life Members	70	73
Regular and Family	349	394
Student	63	87
Corresponding	2	6
Total Members	484	560

This number has increased by 76 since last year, in part due to new members who joined at the Girdwood Meeting.

FINANCIAL ACCOUNTS

PSG maintains a number of bank accounts. The operating funds are kept in a regular checking account.

Regular Checking	September 30, 2005	\$18,311.65
	September 30, 2006	\$37,992.58

A Morgan Stanley money market account is kept as an emergency account.

Morgan Stanley	September 30, 2005	\$21,937.65
	September 30, 2006	\$22,773.68

Our Endowment Fund (Life Memberships and other specially designated monies) IS kept in a mutual fund managed by Neuberger and Berman.

Endowment Fund	September 30, 2005	\$128,294.99
	September 30, 2006	\$136,638.86

OTHER ACCOUNTS

Pacific Seabirds

Vivian Mendenhall maintains an account to facilitate the printing and mailing of Pacific Seabirds

Balance as of	September 30, 2005	\$1,477.22
	September 30, 2006	\$2,026.10

Canadian Memberships

Ken Morgan maintains an account in Canada so that Canadian members can pay dues in Canadian dollars.

Balance as of	September 30, 2005	\$62.53
	September 30, 2006	\$786.16

United Kingdom Memberships

Mark Tasker maintains an account in the UK so that UK members can pay their dues in Pounds Sterling.

Balance as of	September 30, 2005:	\$899.23
	September 30, 2006	\$1,129.24

TOTAL ASSETS

Total Assets as of September 30, 2005	\$170,983.27
Total Assets as of September 30, 2006	\$201,346.62

TREASURER'S REPORT

	2005-2006 Proposed	2005-2006 Actual	Notes
ORDINARY INCOME/EXPENSE			
Income			
Membership Dues	\$9,000	\$9,259	(1)
Books/Publications	\$1,000	\$270	(2)
Donations (restricted)		\$370	(3)
Donations (unrestricted)		\$5	
Total Income	\$10,000	\$9,904	
Expense			
Bank Service Charges	\$25	\$218	
Pacific Seabirds	\$4,500	\$4,000	(4)
Marine Ornithology	\$6,000	\$2,445	(5)
Dues and Subscriptions	\$500	\$312	
Insurance	\$1,850	0	(6)
Elections	\$250		
Office Supplies	\$50	\$27	
Postage and Delivery	\$300	\$331	
Printing and Reproduction	\$100	\$1,026	
Professional Fees	\$850	\$400	(7)
Telephone	\$600	\$166	(8)
State Taxes	\$20		
Chair's discretionary funds	\$1,000	0	
Website Hosting	\$110		
Total Ordinary Expenses	\$16,155	\$8,925	
Net Ordinary Income	\$(6,155)	\$979	
OTHER INCOME/EXPENSE			
Other Income			
Annual Meeting	\$5,000	20,413	(9)
Dividends	\$400	\$926	(10)
Total Other Income	\$5,400	\$21,339	
NET INCOME	(\$755)	\$22,318	

GENERAL COMMENTS

Again in 2006, PSG was very healthy financially. These numbers reconcile with our tax statements for the fiscal year. The numbers do not reconcile with other reports, such as the annual meeting reports. This is because annual meeting expenses and income do not fall under a single fiscal year.

NOTES

1. Membership dues and membership numbers went up this year, and we have been aggressive about retaining members. Online registration and credit card use are now in place and working quite well. We are going to close the UK account this year as almost all UK members are renewing via credit card.
2. We are not very aggressive or successful at selling books and publications.
3. Restricted Donations are those designated for a specific cause. Restricted donations for 2006 were: Conservation, \$100; Endowment Fund, \$270.
4. Reconciliation for *Pacific Seabirds* account was received too late for inclusion in this report (February 2007).

TREASURER'S REPORT

5. The expenses of *Marine Ornithology* have been coming in under the budgeted amount.
6. Because of my "sabbatical" and a mis-mailed bill, we did not pay insurance fees last year. The new policy is about \$250 less expensive annually.
7. This includes about \$500 for bookkeeping and other support work (mailing copies of *Pacific Seabirds*, books that are ordered) which I get from our bookkeeper.
8. This is for the mid-season and other conference calls.
9. As in the past few years, an important part of our annual income comes from the Annual Meeting. These proposed numbers are from the proposed budget of the Local Committee for the Annual Meeting at Asilomar in February 2007.
10. Dividends are from the Morgan Stanley account are considered part of the general operating income; interest and any increases in the

INFORMATION FOR CONTRIBUTORS

Pacific Seabirds is a journal of the Pacific Seabird Group. Manuscripts and news items are welcome on any topic relating to Pacific seabirds or to their conservation. Short manuscripts are preferred (about 1,000 to 5,000 words for major submissions). Submit materials to the Editor (except as noted below): Dr. V.M. Mendenhall, 4600 Rabbit Creek Road, Anchorage, Alaska 99516; e-mail fassgadair@attalascom.net. Deadlines are normally 15 April for the spring issue and 15 October for the fall issue.

CONTRIBUTIONS

Contributors are invited to submit the following:

- **Articles** on original research (to be peer-reviewed)
- **Reports** on current topics (e.g., research in progress or seabird conservation issues; not peer-reviewed)
- **Forum** (discussion of a current topic)
- **Review articles** (these may cover seabirds worldwide)
- **Conservation News** (*submit to* Craig Harrison, Conservation Chair; e-mail charrison@hunton.com)
- **News items** (short news relating to seabird research, conservation, or the Pacific Seabird Group)
- **Book reviews**
- **Letters** commenting on content of *Pacific Seabirds* or other issues
- **Art work**, such as sketches of seabirds, either accompanying a text or for publication alone

PEER-REVIEW OF MANUSCRIPTS

Articles and review articles will be submitted to two peer reviewers for technical review. Other submissions may be sent for review if the author requests this or at the editor's discretion.

SUBMISSION OF MANUSCRIPTS

Material may be submitted by e-mail or regular mail or (addresses above). Materials sent by e-mail should be attached to the main message and should be in Word, WordPerfect, or Rich Text Format, except that materials less than 300 words long may be sent in the body of the e-mail. For manuscripts submitted by e-mail, figures must also be sent as separate files or via regular mail. If a manuscript is submitted by regular mail, include a CD.

FORMAT OF MANUSCRIPTS

Contributors should consult format used in a recent issue of *Pacific Seabirds*.

GENERAL FORMAT

Manuscripts should be double-spaced with 1-inch margins. If your paper size is **A4** (European), **the bottom margin must be at least 1¼ inch** (including in electronic files), to ensure that it will print properly on U.S. equipment. Pages should be numbered, except for Tables and Figures.

Give the scientific name (*italicized*) after the first mention of any genus or species. English names of bird species are capitalized (e.g., Fork-tailed Storm-Petrel). Names of mammals, other taxa, and English names of bird groups are lowercase, except for proper names (e.g., blackbirds, shield fern, Steller's sea cow).

If you use an acronym, give the entity's *full* name the first time it is mentioned. Avoid excessive use of acronyms.

Use the 24-hour clock without a colon (e.g., 1830). Give dates as day-month-year. Use metric measures, except when quoting informal statements. For

INFORMATION FOR CONTRIBUTORS

quantities less than 1, use an initial 0 ($P = 0.95$, not $P = .95$).

Typographical conventions follow *Scientific Style and Format*, 6th edition, by the Style Manual Committee of the Council of Biology Editors; Cambridge University Press (1999).

ORGANIZATION

Articles should contain the following sections, in this order: Title, Author(s), Authors' affiliations (including e-mail for corresponding author), Abstract, Key words, Introduction, Methods, Results, Discussion, Acknowledgments, Literature Cited, Tables, Figure legends, and Figures. **Other types of manuscript** may use a different organization (e.g., a review or report could contain sections on various locations); however, the same formats for Literature Cited, Tables, and Figures will apply.

Abstract—An abstract is required for longer articles and suggested for short ones. It should contain essential information from each section of the text, without statistics. One or more additional abstract(s) may be provided in languages other than English.

Key words—Five to 10 words for use in computerized searching. Species names in both Latin and English should be included.

Introduction—Present the aims and significance of the work, and place it in the context of pre-existing information. State hypotheses that are being tested, if any.

Methods—Describe the methods, location, time, and personnel of the study. Include statistical methods, if any.

Results—Present results that are pertinent to aims given in the Introduction. Where feasible, summarize information and give the full data in Tables or Figures. Give sample sizes and the significance levels of statistical tests. Literature citations normally should not be in the Results section.

Discussion—Summarize the results briefly, then evaluate the results, and develop their importance in relation to other work. Do not include primary results and statistical tests, which belong in Results.

Text citations should be "Surname year." Two authors are "Surname and surname year"; 3 or more authors are "Surname et al. year" (but all authors should be given in the Literature Cited). E.g., (Pratt et al. 1987, Schreiber and Schreiber 1988). If appropriate, specify page number(s) in a book or long article (Pratt et al. 1987:32-34).

Literature Cited—List all references in alphabetical order of the authors' surnames. Surname of the first author should be listed first, then initials; subsequent authors' names should be listed as Initial(s), Surname. List all authors in the Literature Cited (do not use "et al."). Year of publication follows, then title and journal reference. Include page numbers for all cited works, including the total number of pages in a book. Use standard abbreviations for journal titles; if you are unsure, spell them out. Spell out names of agencies and institutions.

The first line of each citation should be justified to the left margin; subsequent lines may be left-justified or indented. Do not use all-capital letters or italics in the Literature Cited, except that scientific names should be in italics. Examples:

- Pratt, H.D., P.L. Bruner, and D.G. Berrett. 1987. A field guide to the birds of Hawaii and the tropical Pacific. Princeton University Press, Princeton, NJ. 409 pp.
Schreiber, E.A., and R.W. Schreiber. 1988. Great Frigatebird size dimorphism on two Central Pacific atolls. *Condor* 90:90-99.

Verify that all items in the Literature Cited are referenced in the article, and vice versa.

For articles that you read in a language other than English, list the citation in the original language. An English translation of the title [in brackets] is optional.

SUPPORTING MATERIALS

Tables—Tables should be numbered in the order they are first mentioned in the text. Refer to each table at least once. Use horizontal lines below the main heading(s); do not use vertical lines in tables. The Table (including its heading) should be comprehensible without

immediate reference to the text. Data in Tables should not be repeated in the text, except to summarize.

Figures—Figures should be numbered in the order they are first mentioned in the text. Refer to each figure at least once. Figures should be drawn at least 50% larger than they will appear in print. Make all lettering, numbers, and symbols large enough to be read easily after they are reduced. The figure (including caption) should be comprehensible without immediate reference to the text. Define all symbols in a legend or the caption. Shading in figures should be black, white, or coarse cross-hatching; do not use half-tone.

For each figure, a high-quality graphics file or original drawing must be submitted with the final version of the manuscript. Graphics files should be in TIFF, GIS, or EFS format; JPG is not recommended.

Photographs—*Pacific Seabirds* occasionally publishes photos. The best ones are very sharp and have good detail and contrast. Digital images submitted by e-mail must be at least 250 dpi (when reduced to publication size). The common low-resolution snapshot (often 72dpi) does not reproduce well in publication; most cameras give the option of higher resolution.

Art work—Original art work is welcomed. The original or a high-resolution scan should be sent. Pen and ink drawings reproduce the most satisfactorily.

REVISIONS AND PROOFS

Materials that are sent for peer review will be returned to the author, along with reviewers' and editorial suggestions. If the Editor has accepted the article, he or she will endeavor to return the manuscript within 60 days. If the article needs major work, the author may be invited to revise and re-submit it for future acceptance.

For peer-reviewed articles, proofs will be mailed to the author before publication. Corrections should be returned within one week. Proofs of other materials will not be sent to the author unless he or she requests them.

PUBLICATIONS OF THE PACIFIC SEABIRD GROUP

The Pacific Seabird Group publishes symposia and other works. **PSG Symposia** are occasionally held at Annual Meetings; those, which have been published, are listed below. **Technical Reports** prepared by PSG working groups also are listed. *To order one of these PSG publications, please see instructions after each item.*

Abstracts of papers and posters given at PSG meetings are published annually. Abstracts for meetings of 1974 through 1993 appeared in the PSG Bulletin (Volumes 2–20); for meetings of 1994 through 2003, in Pacific Seabirds (Volumes 21–30); and for meetings of 1997 and later, at www.pacificseabirdgroup.org

PSG publishes the journals *Pacific Seabirds* (www.pacificseabirdgroup.org) and *Marine Ornithology* (www.marineornithology.org). Current and past issues of both journals are available online or by subscription. Back issues may be obtained online; those of Pacific Seabirds also are available from the PSG Treasurer (order form on last page).

SYMPOsia

SHOREBIRDS IN MARINE ENVIRONMENTS. Frank A. Pitelka (Editor). Proceedings of an International Symposium of the Pacific Seabird Group, Asilomar, California, January 1977. Published June 1979 in Studies in Avian Biology, Number 2. *Available free of charge at* <http://elibrary.unm.edu/sora/Condor/cooper/sab.php>

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